STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

Contents ... September 13, 1937

Volume 101 - No. 11

Reader Comments 11
As the Editor Views the News 15
Steelworkers' Prosperity Causing Drift to Rural Areas 17
Refrigerators Taking Heavy Tonnage 18
Ingot Output Gains 6.7 Per Cent in August 19
Steelworks Operations for the Week 19
Steel Exports Near High 1917 Record 20
Large Attendance at Mining Convention 21
Activities of Steel Users and Makers 23
Men of Industry 24
Obituaries 25
Mirrors of Motordom 27
Windows of Washington 31
Is Business More Sensitive to Bearish News?—*Editorial* 33
The Business Trend—Charts and Statistics 34
New Low Alloy Steels Result from Research 36
Pipeline Constructed by "Stovepipe" Method 42
Materials Handling 45
Progress in Steelmaking 48
Welding Should Be Held to Required Amount 54
Plants Keep Pace with Modern Architecture 56
Power Drives 59
Surface Treatment and Finishing of Metals 62
The Process of Magnetic Separation 65
Generating Controlled Atmosphere 70
Welding, etc.—*Robert E. Kinkead* 75
New Equipment Descriptions 76
Recent Publications of Manufacturers 81
Market Reports and Prices 87-108
New Construction and Incorporations 109
Index to Advertisers 116

EDITORIAL STAFF

E. L. Shaner, Editor
E. C. Kreutzberg, Development Manager
A. J. Hain, Managing Editor

Associate Editors

E. F. Ross — J. D. Knox
G. H. Manlove — J. A. Cronin
W. L. Hammerquist — F. E. Gooding

NEW YORK
B. K. Price — L. E. Browne

PITTSBURGH
D. R. James

CHICAGO
W. G. Gude

DETROIT
A. H. Allen

WASHINGTON
L. M. Lamm

LONDON
Vincent Delport

BUSINESS STAFF

G. O. Hays, Business Manager
R. T. Mason, Circulation Manager
C. H. Bailey, Service Manager

NEW YORK
E. W. Kreutzberg — B. C. Snell

PITTSBURGH
S. H. Jasper — D. C. Kiefer

CHICAGO
L. C. Pelott — W. F. O'Dell

CLEVELAND
R. C. Jaenke

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

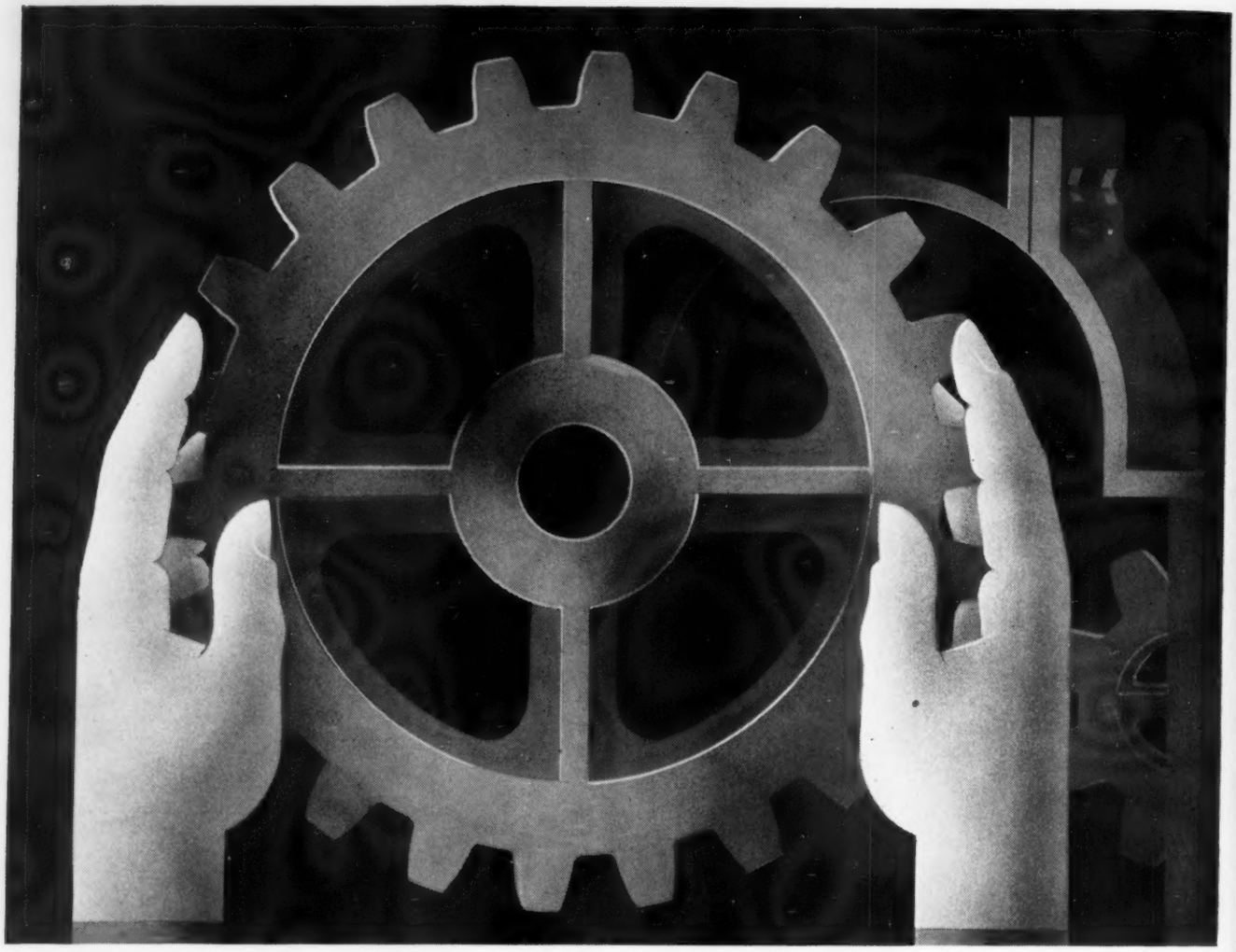
Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1937 by the Penton Publishing Co.

Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, O.
John A. Penton, *Chairman of Board;* **E. L. Shaner,** *President and Treasurer;* **J. R. Dawley and G. O. Hays,** *Vice Presidents;* **F. G. Steinebach,** *Secretary.*

BRANCH OFFICES

New York ..... **220 Broadway**
Chicago ..... **Peoples Gas Building**
Pittsburgh ..... **1650 Koppers Building**
Detroit ..... **1010 Stephenson Building**
Washington ..... **National Press Building**
Cincinnati ..... **418-420 Sinton Hotel**
San Francisco ..... **2413 Milvia St. Berkeley, Calif., Tel. Berk. 7354-W**
London ..... **Caxton House Westminster, S. W. 1**
Berlin ..... **Berlin, N. W. 40, Roonstrasse 10**



It "couldn't be done"—so MOLY did it

Parallel to the difficulty of putting square peg into round hole was the problem of a machinery manufacturer who needed a stronger gear, when space limitations prohibited making it larger.

A Manganese-Moly steel was used—and the problem was solved! . . . Without increase of size or weight, the needed strength was obtained.

Doing the unusual—saving material; increasing weight, strength ratio; simplifying fabricating processes; speeding production and reducing its costs—all have become a regular thing in the fast-moving history of industry's most versatile alloying element. Steels and irons containing Moly are demonstrating their many advantages both in the making and in the performance of many important products and equipment parts.

Our free technical book, "Molybdenum," will prove useful to engineers and production heads interested in cost cutting and product improvement. Our monthly news-sheet, "The Moly Matrix," keeps readers informed on Moly developments. Consult our laboratory when ferrous problems get tough. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

Climax Mo-lyb-den-um Company

MOLY

As the Editor Views the News

A SURVEY by the American Iron and Steel institute covering 157,000 employes of steel companies in Ohio, Pennsylvania and West Virginia reveals information which, if representative of industry as a whole, has an important bearing upon the economic development of the country. The study (p. 17) shows that three out of four are owners of automobiles and that 35 to 40 per cent live in rural communities. The picture of steel workers with economical transportation, many free hours for leisure, and living in uncongested districts is quite different from the conventional idea held by many that employes live in crowded, uninviting mill towns.

• • •

Moving to The Country

Another interesting point is that in plants situated in agricultural areas, as many as 10 to 15 per cent of the employes own or lease farms. This, coupled with the apparent general tendency of workers to get out into the rural or semirural communities, can be attributed in part to greater freedom occasioned by shorter hours and to higher income, but it also reflects the instinct of employes to seek the security and economy of country life. Closeness to the soil was a safeguard to thousands in the recent depression. Many of them have not forgotten the lessons of that period.

• • •

Must Rebuild America

But the most significant feature of the institute's survey is that the freedom made possible by the ownership of automobiles by new millions will present new problems in the planning of cities, towns and highways and in the location of plants, schools, stores, dwellings and public buildings. It is not difficult to believe that we are on the verge of a new, or perhaps a more pronounced, shift of population from congested to rural districts. Already there is evidence that communities are trying to adjust themselves to this trend. However, complete adjustment—when it comes—will mean a great volume of reconstruction, relocation, etc. Transportation systems, even now in the process of change, probably will require more drastic revamping than is contemplated. Sometime building construction, now lagging, again will come into its own. Migration of workers may help speed that day.

• • •

Plants Go Modernistic

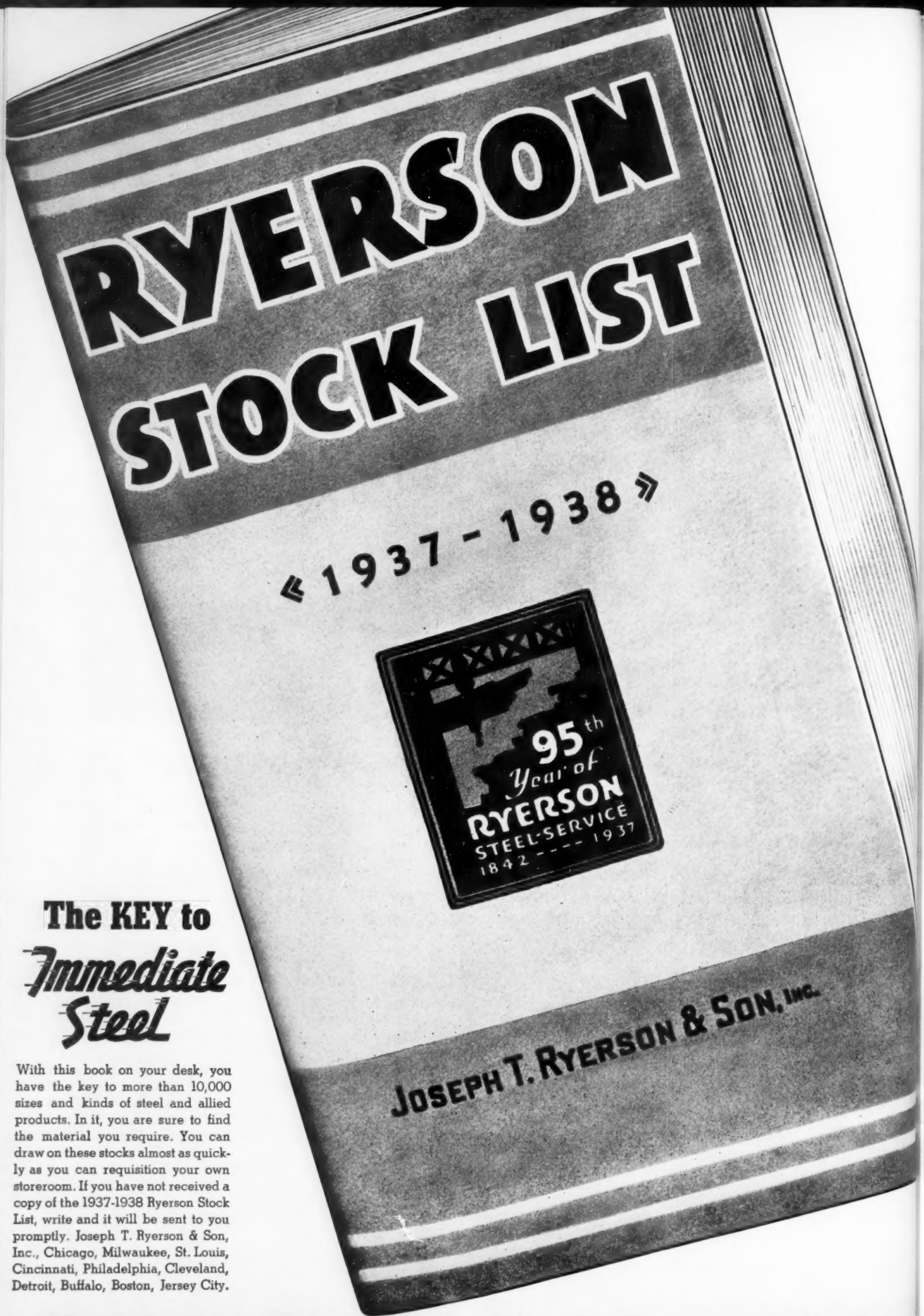
Industry seems to be adopting a new style of architecture for many of its new plants. Illustrations of five structures recently completed in the Detroit area (p. 56) show a tendency toward modernistic treatment of the exteriors. This effect is achieved by the use of curved surfaces, especially around entrances. In these and other typical examples of recent plant construction, a large portion of the sidewall area is devoted to windows and in some instances translucent glass block is employed for wall construction. While the new structures are decidedly more attractive in appearance than the orthodox factory buildings of the predepression period, architects and engineers also have introduced noteworthy improvements which add to the utility of the new plants.

• • •

Regenerative Idea in Mills

When regenerative braking was introduced on the electrified sections of certain railroads, it was considered a most interesting application of that obedient servant—electricity. Today the same idea is being used successfully in drag generators (p. 48) which are employed to hold strip in tension between the feed reel and the main rolls of strip mills. The application illustrates the flexibility and adaptability of the electric motor when it is installed properly and equipped with suitable controls. . . . One would not think that "over-lubrication" should be a problem (p. 60), but it is a point worth watching in the operation and maintenance of anti-friction bearings. . . . Detailed data on tests of "Mayari R" steel (p. 36) provide useful information on the characteristics of a member of the growing family of low-alloy structural steels.

E. L. Shaner



The KEY to *Immediate Steel*

With this book on your desk, you have the key to more than 10,000 sizes and kinds of steel and allied products. In it, you are sure to find the material you require. You can draw on these stocks almost as quickly as you can requisition your own storeroom. If you have not received a copy of the 1937-1938 Ryerson Stock List, write and it will be sent to you promptly. Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Philadelphia, Cleveland, Detroit, Buffalo, Boston, Jersey City.

Write for this New Steel Buyers' Guide

Steelworkers' Prosperity, Leisure, Automobiles Causing Drift to Rural Areas

STEELWORKERS have chosen automobile driving as their favorite leisure time activity. Three out of four now own cars, according to an estimate by the American Iron and Steel institute based on information obtained from representative steel plants in Ohio, Pennsylvania and West Virginia.

Of the 157,000 steelworkers covered by the study, approximately 117,000 owned passenger cars. If the ratio of car ownership found in these representative steel plants holds good throughout the industry, about 400,000 of the 533,000 workers now own cars.

Steel employes drive extensively, not only on the open road but also to work from their homes, which are now generally located farther from the mills than when automobile ownership was less widespread. The inquiry showed that between 60 and 80 per cent of the men arrive at the plants in their own or in fellow-employes' cars.

Car Ownership at Peak

Ownership of cars by wage earners in the industry is apparently at a higher level than ever before, the inquiry revealing that parking lots in most plants are generally more congested than at any previous time.

Personnel executives reported that a wave of car buying by steelworkers began early in 1936 and has since been carried forward by gains in steel operations and in wage rates which have raised the current hourly earnings of steelworkers nearly 35 per cent above the level of 1929.

The larger amount of leisure time made available to steelworkers through the reduction in the average work-week from 55 hours in 1929 to about 40 hours at present, with the adoption of the five-day week and of vacations with pay, were also cited as factors in the increased car ownership.

The study also indicated that the possession of cars, coupled with improved public transportation systems and the shortening of the work-week, has permitted thousands of steelworkers to move to rural or semirural surroundings at some distance from the mills in which they work. At plants located in agricultural areas as many as 10 to 15 per cent of the men own or lease farms, reports indicated. As many as 35 to 40 per cent of the workers "live in the country." The total in each category has shown a substantial increase since 1929.

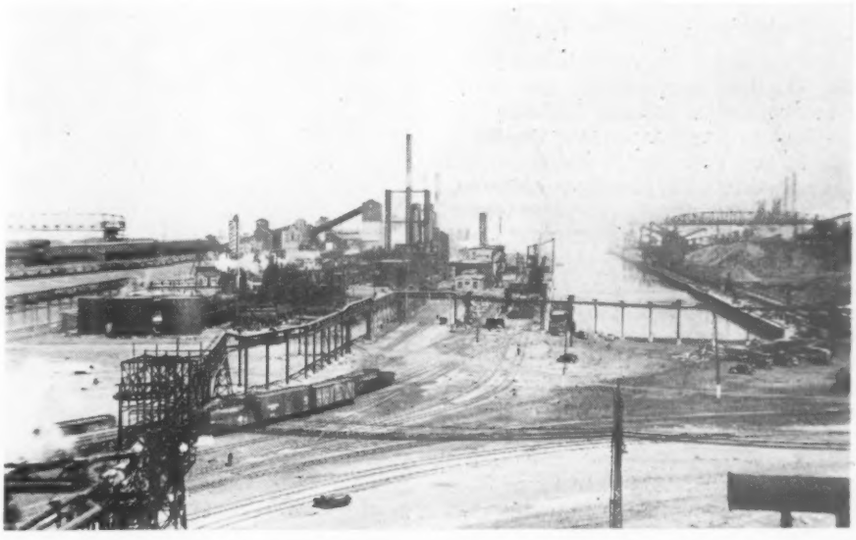
The rise in the last 18 months to what is generally believed to be a new high record in the proportion as well as in the number of automobile-owning steelworkers is noteworthy in view of the fact that in the country as a whole, automobile ownership failed to keep pace with the rise in population from 1929 to 1937.

Car-ownership among steelworkers appears to be considerably above the national average.

Allowing an average of three dependents for each steel wage earner, there is approximately one car for every 5.3 persons among the group of 2,132,000 steelworkers and their dependents, which compares with the national average of one car to every 5.8 persons. As against the American average, there was one car for every 19 persons in France in 1936; one for every 20 persons in England; and one for 49 persons in Germany.

The number of steel wage earners who drive to work varies from

Ship Canal Extends Into Steel Plant



INCOMING and outgoing traffic is assisted materially by means of this ship canal, 200 feet wide, 23 feet deep and 4000 feet long, which extends into Bethlehem Steel Co.'s Lackawanna plant from Lake Erie. Here vessels may be docked to be loaded with finished steel products for water shipment to lake ports or, by way of the St. Lawrence river or the New York state barge canal and the Hudson river, to ocean ports. Iron ore, limestone and other materials are unloaded on the docks direct from vessels

plant to plant. On the average, a little less than 50 per cent of the men who own cars, or about 33 per cent of the total number employed, drive to work and use company parking lots.

Because most steelworkers who drive their cars to the mill bring one or more fellow-employes, it is estimated that on the whole between 60 and 80 per cent of the steelworkers either go to the mills in their own cars, or in other steelworkers' cars.

This widespread use of automobiles has made the parking problem serious at many steel plants, the problem becoming especially acute when the shifts change. Congestion is caused by the arrival of the new shift before the men whom they are relieving have left the plant. At such a time, a typical mill employing 6000 workers, in three shifts of 2000 each, may have as many as 1300 cars parked or arriving.

ONE-THIRD OF A CENT PROFIT ON POUND OF STEEL

Net earnings of 100 iron and steel producing companies in the first half of 1937 aggregated $159,054,209, and were equivalent to a profit of about one-third of a cent per pound of iron and steel shipped by the companies during the period, according to the institute.

The earnings during the half-year period represented an average return of 4.17 per cent on investment. Shipments of iron and steel products, including pig iron, by the group of 100 companies during the six months amounted to 23,875,442 gross tons. Rate of operations in the industry was 85 per cent of capacity during the period.

Payrolls Up 46 Per Cent

The volume of payrolls in the first half of the year was 46 per cent greater than the total of $396,662,446 paid out in payrolls during the first half of last year by the same group of companies. Employment likewise showed a substantial increase over last year, 695,534 being employed by the group of 100 companies reporting this year, or 23 per cent more than the 563,473 employed a year ago by the same companies.

Tax payments of the industry increased sharply in the first six months, largely as the result of higher tax rates under the social security laws.

A total of $86,438,993 in taxes was paid by the companies during the half year. By comparison, the same companies in the first half of last year paid out only $41,977,747 in taxes, indicating an increase within one year of more than 105 per cent in the total of taxes levied on the industry.

Unemployment reserve taxes levied on the payrolls of the industry accounted for $11,395,887 of the total taxes paid in the first half of 1937, while an additional $5,815,106 represented levies under old age pension fund provisions of the social security act. The latter sum was matched dollar for dollar by the compulsory deductions from the employes' pay envelopes, which averaged $8 for each employe of the companies.

Refrigerators Taking Heavy Tonnage

HOUSEHOLD refrigerator sales for the first seven months this year are running considerably ahead of the corresponding period of other years, presaging a new high in the amount of iron and steel required from this source.

Total sales for the first seven months were 1,902,742 units, valued at $161,046,033, according to the National Electrical Manufacturers association. Sales for the entire year will approximate 2,378,000 units, it is estimated on a basis of ratio of business in first seven months of the past two years to that for the full year.

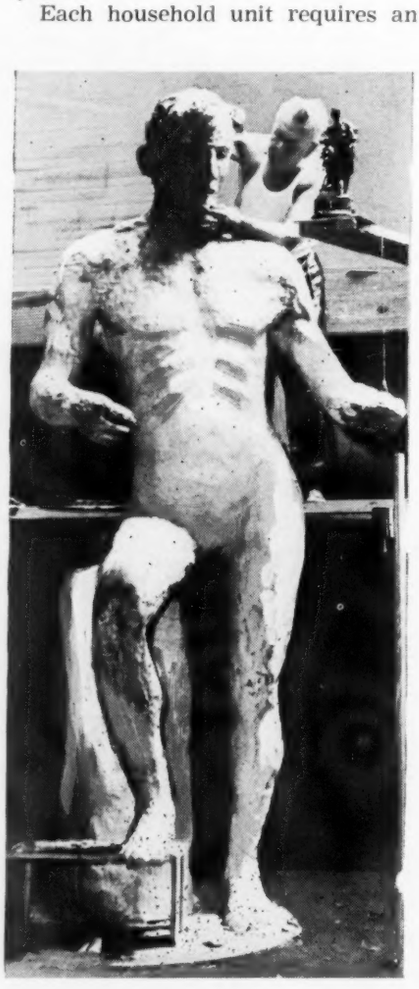
Each household unit requires an average of 190 pounds of iron and steel. Thus ferrous metal consumption for 1937 refrigerators is expected to be 225,910 tons. Principal steel item required is cold-rolled sheets for the exterior. Exteriors sometimes are enameling iron while linings often are cold-finished sheets. Hot-rolled annealed pickled sheets are used extensively in some types. Leg stock often is heavy hot-rolled pickled sheets while stainless steel often is used for the freezing units and grill work.

Sales in the first seven months this year exceeded total sales in all prior years except 1936. Last year sales for first seven months were 1,616,912 and for 12 months, 2,067,257. In 1935 corresponding figures were 1,224,118 and 1,570,383.

This year's peak was reached in March when 353,557 units were sold. Sales tapered gradually in April, 338,214 units, and May, 333,869, to 192,052 units in July. This is more or less in line with the usual seasonal trend although widespread strikes with their resultant effect on household budgets contributed to the decline in recent weeks.

Bulk of sales are to domestic buyers. Of the total reported this year, only 136,879 units were exported.

Sales of commercial refrigeration units, including air-conditioning equipment, have been heavy although reclassification of this equipment makes comparisons with other years impossible. Air-conditioning sales especially have increased.



◆

"Metal Man" Symbolizes Industry in Metal Show

CENTRAL figure in the National Metal exposition, Atlantic City, N. J., Oct. 18-22, will be this 10-foot papier mache replica of the 12-inch bronze statuette shown at the figure's left shoulder. It will stand on a 3-foot pedestal and will be specially illuminated. The original statuette, made in Austria, was bought several years ago by W. H. Eisenman, secretary of the American Society for Metals, and has been installed in the society's offices in Cleveland. It is known only as the "Metal Man," symbolic of the industries represented in the society. The papier mache figure will be bronze painted. Rail, hammer, gear, compass and vise which will be part of the statue will be made of wood, bronzed. National Decorators Inc., Detroit, is making the replica as part of the general decoration work for the exposition

Ingots Gain 6.7 Per Cent in August

PRODUCTION of open-hearth and bessemer steel ingots in August reached a total of 4,861,789 gross tons, an increase of 6.7 per cent over the July total of 4,556,596 tons, according to the American Iron and Steel institute. August production was more than 16 per cent over the output of 4,184,287 tons in August, 1936, but failed to equal the record of 4,939,086 tons in August, 1929.

Ingots produced in eight months this year totaled 38,183,018 tons, compared with 29,374,754 tons in eight months of 1936 and 38,825,943 tons in the corresponding period of 1929. The total for eight months this year is only 1.65 per cent under that for 1929.

Production during August was calculated at 1,097,469 gross tons per week, compared with 1,030,904 tons per week in July and 944,534 tons per week in August, 1936.

During August the steel industry operated at an average rate of 83.55 per cent of capacity, compared with 78.49 per cent in July and 72.11 per cent in August, 1936, according to the institute's figures. The average of STEEL's estimate of steel ingot production in August is 83.6 per cent of capacity.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Sept. 11	Change	Same week 1936	Same week 1935
Pittsburgh ..	69	—14	72	48
Chicago	73	—13	72½	59
Eastern Pa...	64.5	—0.5	47½	35½
Youngstown..	65	—8	67	57
Wheeling	76	—15	98	84
Cleveland ...	62	—16	79½	67
Buffalo	79	—7	81	35
Birmingham..	91	None	64	48½
New England	65	—5	70	73
Detroit	100	+5	100	94
Cincinnati ...	89	None	76	†
St. Louis....	77	None	†	†
Average....	72	—11	69½	54

†Not reported.

Production

LABOR day idleness and necessity for repairs to furnaces cut the average steelmaking rate sharply last week but resumption after the holiday apparently carried the rate back to within a few points of the level of recent weeks. The national rate last week as a whole was 72 per cent of capacity, but by mid-week production had been resumed to about 78 per cent.

Chicago—Down 13 points to 73 per cent. Recovery to about 86 per cent is in prospect for this week and no major reduction is expected before October.

Buffalo—Down 7 points to 79 per cent. Bethlehem Steel Co. has dropped two open hearths, one for repairs.

St. Louis—Unchanged at 77 per cent of capacity.

Central eastern seaboard—Down 0.5 point to 64.5 per cent. The leading independent is less active but another interest has added a furnace. One mill now operating three days will increase to five days this week.

Birmingham, Ala.—Unchanged at 91 per cent. Schedules for this week show a decline to 85 per cent, one open hearth being taken off for repairs.

New England—Off 5 points to 65 per cent. This loss will be more than regained this week when ingot production is expected to reach 75 per cent.

Detroit—Up 5 to 100 per cent, all 21 furnaces melting.

Pittsburgh—Due to observance of the Labor day holiday, steelworks operations in the Pittsburgh district last week went down 14 points to 69 per cent. Following the holiday, however, producers returned to practically the same rates that prevailed in the week ended Sept. 4.

Wheeling—Down 15 points to 76 per cent because of observance of Labor day. Producers speedily resumed operating at practically the same rate that prevailed the week ended Sept. 4.

Cincinnati—Unchanged at 89 per cent, three open hearths being idle for reserve and repairs.

Youngstown—Down 8 points to 65 per cent. Six open hearths were taken off during the week, Republic taking off two at Warren, O., and one at Youngstown; Youngstown Sheet & Tube Co. one at Campbell, O., and one at Brier Hill, O.; Sharon Steel Corp. one at Lowellville, O., for repairs. Republic Steel Corp. will start a fourth blast furnace this week and improve finishing activity, but steelmaking will be unchanged.

Cleveland—Decline of 16 points to 62 per cent. Republic Steel Corp. has dropped six open hearths while changing its 40-inch mill to 44-inch width, now having only six in production.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent

1937	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.....	4,433,145	84.20	291,794	54.30	4,724,939	81.43	1,066,578	4.43
Feb.....	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March.....	4,812,879	91.42	403,787	75.14	5,216,666	89.91	1,177,577	4.43
April.....	4,681,677	91.83	390,198	74.98	5,071,875	90.27	1,182,255	4.29
May	4,767,269	90.55	386,290	71.88	5,153,559	88.82	1,163,332	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July.....	4,220,561	80.09	336,035	62.67	4,556,596	78.49	1,030,904	4.42
Aug.	4,488,361	84.98	373,428	69.49	4,861,789	83.55	1,097,469	4.43
8 mos.....	35,385,245	.....	2,797,773	.....	38,183,018	.....	1,099,741	34.72
1936								
Jan.....	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.....	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March.....	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April.....	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May.....	3,735.283	71.93	302,092	49,55	4,037,375	69.58	911,371	4.43
June	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July.....	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.....	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
8 mos.....	27,171,950	.....	2,202,804	.....	29,374,754	.....	848,443	34.86
Sept.....	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
Oct.....	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
Nov.....	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
Dec.....	4,119,025	79.50	305,342	50.20	4,424,367	76.42	1,000,988	4.42
Total....	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons bessemer, 6,325,000 gross tons; for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

Shortage of material for cast iron segments for lining a transportation subway in the east portion of London is holding up work on a $72,500,000 transport development from Leytonstone to Newbury Park. The East London subway is part of a $200,000,000 project to extend the central London tube to various suburbs.

Steel Exports Near High 1917 Record

FOR the first time in 20 years iron and steel exports from the United States in July, excluding scrap, closely approached the 1917 monthly average of shipments, according to the metals and minerals division of the department of commerce.

Finished and semifinished iron and steel exports in July were 461,391 gross tons, valued at $26,489,190, from the standpoint of volume only 60,987 tons, 11.7 per cent, short of the 1917 monthly average of 522,378 tons. The nearest approach to the 1917 level had been in 1918 when the monthly average was 447,522 tons.

In 1917 a grand total of 6,268,546 tons of semifinished and finished steel and iron products was exported, representing the highest volume in the 1901 to 1936 period and probably the peak annual level of shipments in the history of exports of steel and iron.

50 Per Cent Above June Exports

The July exports compare with 306,281 tons valued at $17,900,048 in June, 1937, a gain of 50.6 per cent in quantity and 48 per cent in value. Compared with 98,991 tons valued at $7,161,426 in July, 1936, the gain is 366.1 per cent in volume and 270 per cent in value. For seven months the cumulative export total is 1,831,424 tons valued at $112,376,553, compared with seven months exports in 1936 of 653,628 tons valued at $48,555,857, an increase of 180.2 per cent in quantity and 131.4 per cent in value.

Scrap exports in July, 1937, totaled 428,047 tons valued at $8,931,694, compared with 520,297 tons valued at $10,493,433 in June, a decline of 17.7 per cent in tonnage and 14.9 per cent in value. Compared with July, 1936, scrap exports increased 117.4 per cent in volume and 262.8 per cent in value.

For seven months this year scrap exports totaled 2,600,707 tons valued at $51,957,619, the highest level in history, 105 per cent in quantity and 234.9 per cent in value above seven months of 1936.

Increases were registered in every export product except riveted pipe in the seven-months totals this year. Pig iron gained 450 per cent over seven months of 1936, steel ingots 88.3 per cent, plates 410.1 per cent, plain shapes 162.9 per cent, steel bars 166.2 per cent, and tin plate 24.6 per cent.

AMERICAN AIR CONDITIONING SALES ABROAD INCREASING

American manufacturers are leading all other countries in development of air-conditioning equipment and its introduction into foreign markets, according to the machinery division, department of commerce.

Sales abroad have expanded from $320,558 in 1935, the first year in which this equipment was reported separately, to $883,482 in 1936. Another substantial increase for 1937 is indicated by the first six months' total of $794,756, an 89 per cent increase over the corresponding period in 1936 valued at $421,452.

Most of the foreign demand has been in commercial and industrial fields. Union of South Africa and Argentina were the leading foreign markets during the first half of this year, taking $84,544 and $84,474 respectively.

FARM EQUIPMENT EXPORTS IN JULY DOUBLE 1936

United States farm equipment exports increased steadily during 1937 to $8,186,409 in July, the highest monthly value since February, 1931, and 108 per cent above July, 1936, shipments of $3,926,140.

Substantial gains were recorded in practically all types of farm implements and machinery, but particularly in tractors, harvesting machinery and cultivating equipment. For the first seven months, exports amounted to $42,690,170, only slightly below the total 1936 exports valued at $43,993,315.

Tractors led the July export gain with 140 per cent increase to $5,271,521 from $2,198,752 in July last year. Harvesting machinery sales abroad increased 122 per cent to $1,104,753 from $502,516. Cultivating impiements were up 71 per cent from $538,561 to $922,690.

WORLD BUYING AMERICAN METALWORKING MACHINERY

Industrial machinery exports in July reached close to a record, exceeding the monthly average of all years except 1929. Foreign sales for the month aggregated $23,736,206, a 58 per cent advance over those of July, 1936. For seven months export shipments totaled $140,983,247, exceeding those of the first seven months last year by 42 per cent.

Power-driven metalworking machinery exports in July were valued at $4,665,741, an increase of 62 per cent over July last year. The gains were distributed over the entire list of equipment but were particularly large in lathes, vertical boring mills and chucking machines, automatic screw machines and internal grinders. Other metalworking machinery exports were valued at $439,351, compared with $276,553 in July, 1936.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

(Gross Tons)

Articles	July 1937	June 1937	Jan. thru July '37
Pig iron	168,538	105,194	474,389
Ferromanganese and spiegeleisen	169	104	1,505
Other ferroalloys	112	279	1,281
*Ingots, blooms, etc.:			
Not con. alloy	46,015	17,009	104,875
Alloy incl. stainless	303	2,614	4,164
Bars, iron	432	130	1,710
Bars, concrete	1,617	1,701	10,121
*Other steel bars:			
Not cont. alloy	16,829	10,380	66,147
Stainless steel	13	68	162
Alloy, not stainless	491	521	3,928
Wire rods	3,775	3,968	28,139
Boiler plate	2,285	659	4,543
*Other plates, not fab.			
Not cont. alloy	45,382	31,563	172,589
Stainless steel	4	5	25
Alloy, not stainless	122	17	2,302
Skelp	11,568	8,396	51,501
Sheets, galv. iron	273	158	3,003
Sheets, galv. steel	6,915	7,001	41,010
*Sheets, black steel:			
Not cont. alloy	30,822	24,380	151,714
Stainless steel	83	83	431
Alloy, not stainless	1,239	566	3,044
Sheets, black iron	557	1,990	6,152
*Strip steel, cold-r'ld:			
Not cont. alloy	3,097	2,687	17,924
Stainless steel	62	16	262
Alloy, not stainless	44	60	376
*Strip steel, hot-rolled:			
Not cont. alloy	5,164	7,347	50,142
Stainless steel	3	2	100
Alloy, not stainless	41	188	477
Tin plate, taggers' tin	34,439	23,207	184,097
Terne plate	193	290	3,258
Tanks, except lined	3,664	2,772	18,344
Shapes, not fab.	22,379	11,623	82,083
Shapes, fabricated	3,897	2,886	20,650
Plates, fabricated	2,613	1,171	12,372
Metal lath	93	131	1,156
Frames and sashes	297	149	754
Sheet piling	144	101	2,295
Rails, 60 lbs.	4,075	3,728	39,985
Rails, under 60 lbs.	635	1,726	7,275
†Rails, relaying	2,090	1,572	13,837
Rail fastenings	1,423	659	6,561
Switches, frogs, etc.	262	201	1,389
Railroad spikes	234	260	1,794
R.R. bolts, nuts, etc.	146	82	629
Boiler tubes, seamless	1,195	1,078	7,316
Do. welded	31	.....	247
Pipe:			
S'ml's c'sing, oil-line	7,406	4,926	43,294
Do. welded	797	81	4,412
Do. seamless black	1,540	931	8,333
Pipe fittings:			
Mall.-iron screwed	624	406	3,118
Cast-iron screwed	347	181	1,809
Pipe, fittings for:			
Cast-iron pressure	1,360	1,254	13,609
Cast-iron soil	259	411	4,595
Pipe, welded:			
Black steel	3,357	1,620	13,789
Black wrought-iron	182	170	3,076
Galv. steel	2,282	1,734	11,939
Galv. wrought-iron	172	65	1,242
Pipe and fittings:			
Riveted iron or steel	32	107	410
Wire:			
Plain iron or steel	4,522	2,425	21,611
Galvanized	3,023	2,166	14,374
Barbed	2,460	2,698	21,330
Woven wire fencing	329	311	2,218
*Woven wire screen:			
Insect	121	65	379
Other	98	78	747
‡Wire rope	599	517	3,352
‡Wire strand	61	27	338
†Card clothing	4	1	35
Other wire	774	1,355	5,589
Wire nails	1,760	1,966	12,974
Horseshoe nails	102	50	535
Tacks	67	24	216
Other nails, staples	173	217	1,757
Bolts, etc.	969	1,019	6,909
Castings:			
*Gray ir'n, semi-st'l	454	315	3,386
Malleable-iron	660	159	3,236
*Steel, not alloy	255	152	1,301
Alloy incl. stainless	149	92	981
Car wh'ls, tires, axles	1,094	1,446	9,217
Horseshoe, calks	6	22	163
*Forgings, n.e.s.:			
Not alloy	1,5[illegible]	532	4,590
Alloy incl. stainless	78	36	502
Total (gross tons)	461,391	306,281	1,831,424
Scrap, iron, steel	420,097	514,651	2,554,862
Scrap, tin plate	1,678	1,712	11,085
†Tin plate circles, strips, cobbles	1,772	1,193	8,530
Waste-waste tin plate	4,500	2,741	26,230
Total scrap	428,047	520,297	2,600,707
GRAND TOTAL	889,438	826,578	4,432,131
Iron ore	211,336	202,124	707,338

*No comparisons available. †New class. ‡No distinction prior to 1936.

Large Attendance at Mining Convention; Undistributed Profits Tax Assailed

IN SALT LAKE CITY, Utah, several thousand representatives of the country's mining industry gathered last week for the annual convention and exposition of the American Mining Congress. Speakers included Senator Key Pittman, Nevada; Senator William H. King, Utah; Representative Abe Murdock, Utah, and several federal administration officials.

The convention program included discussions on mining and milling practices, operation of the Wagner labor relations act as it affects the mining industry, wage and hour legislation, the monetary system present and future, depletion, mine taxation, application of the securities and exchange act to mining and other subjects.

Assails Raids by State Legislatures

That state legislatures are raiding the mining industry as a source of easy money, without sufficient understanding of mining problems nor the effect of such raids upon the industry, was charged by W. Mont Ferry, vice president and managing director, Silver King Coalition Mines Co., Salt Lake City.

Attacking the federal undistributed profits tax, Mr. Ferry said:

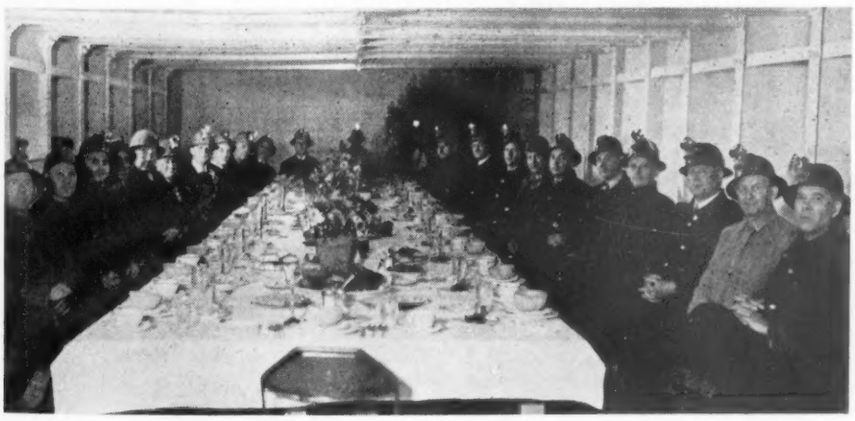
"Surplus earnings must be conserved to meet adverse economic conditions. The chaos from which we are emerging furnishes a striking example of how metal miners used their reserves to maintain employment when men were desperately but vainly seeking some work which would furnish food for their families. These reserves kept many payrolls alive when production was a losing game."

The Wagner labor relations act is "more far reaching than any national legislation heretofore existing," declared W. W. Ray, Salt Lake City attorney. He outlined probabilities of its applications to various mining and smelting concerns.

Mine Equipment Exhibited

Exhibitors of mining machinery and equipment included many in the iron and steel and metalworking field. Among these were: Bethlehem Steel Co.; United States Steel Corp.; Mine Smelter & Supply Co., Denver; American Car & Foundry Co., New York; Robins Conveying Belt Co., New York; Link-Belt Co., Chicago; Mine Safety Appliances Co., Pittsburgh; Galigher Co., Salt Lake City, Utah; Broderick & Bascom Rope Co., St. Louis; Sauerman Bros. Inc., Chicago; Oliver United Filters Inc., Oakland, Calif.; Templeton, Kenly & Co., Chicago; Dorr Co., New York; National Carbon Co. Inc., Cleveland; Jeffrey Mfg. Co., Columbus, O.; Bucyrus-Erie Co., Milwaukee; Caterpillar Tractor Co., Peoria, Ill.; Colorado Fuel & Iron Corp., Denver; General Electric Co., Schenectady, N. Y.; Anaconda Wire & Cable Co., New York; Thomas A. Edison Inc., West Orange, N. J.; du Pont de Nemours & Co., Wilmington, Del.; John A. Roebling's Sons Co., Trenton, N. J.; Timken Roller Bearing Co., Canton, O.; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Bullard Co., Bridgeport, Conn.; Coppus Engineering Corp., Worcester, Mass.; Electric Storage Battery Co., Philadelphia; Fairbanks, Morse & Co., Chicago; A. Leschen & Sons Rope Co., St. Louis; Linde Air Products Co., New York.

Safety Committee Dines 236 Feet Underground



CLAD in overalls, boots and steel helmets, members of the safety committee of the United States Steel Corp. recently descended 236 feet below the surface of Oliver's Spruce mine at Eveleth, Minn., to be guests at a novel luncheon in an underground theater used primarily for employes' safety meetings. Cut out of solid rock, the room is 8 x 17 x 51 feet, steam heated and electrically lighted, with a seating capacity of 220

Sheet & Tube Plans To Improve Chicago Plant

New financing by Youngstown Sheet & Tube Co., Youngstown, O., to be considered at a special meeting of shareholders Oct. 19, (STEEL, Sept. 6, page 31), is largely to provide for betterments of productive facilities. It is proposed to expend some $20,000,000 for improvements, particularly at the Indiana Harbor, Ind., plant to provide additional ingot and finishing capacity and to replace certain units at this plant to give material saving in cost and improved quality of products.

During the past three years the company, without permanent financing for that purpose, has expended for plant improvements and additions about $12,000,000 more than has been charged to depletion and depreciation during that period. Most of this expenditure has been in the Youngstown district.

The contemplated issue of 500,000 additional shares of common stock, to be sold at about $60 per share, will yield $30,000,000, to be applied to covering the improvement work and providing additional working capital made necessary by increased production.

Seeks Wider Use of Pennsylvania Iron Ore

In an effort to revive as far as possible the use of iron ores mined in Pennsylvania, which declined when the richer Lake Superior ore was discovered, the mineral industries experiment station of Pennsylvania College is seeking funds for research in methods for beneficiating the local ores. Though Pennsylvania produces more pig iron than any other state it is largely from Lake Superior ores. In the early days of the iron and steel industry the local ores were used exclusively and much of the pig iron was made in the eastern part of the state.

In the effort to utilize state resources and add to employment and wealth the department of internal affairs of Pennsylvania, Thomas A. Logue, secretary, Harrisburg, is pressing needs for research into known ore deposits and exploration to develop new sources.

Meetings

GREASE INSTITUTE TO HOLD CONVENTION IN CHICAGO

National Lubricating Grease institute will conduct its fifth annual convention at the Blackstone hotel, Chicago, Oct. 4-5. The program includes three technical sessions, a business session, and a banquet. New officers will be selected at the business meeting.

Among the technical papers of interest to the iron, steel and metalworking industries are the following: "Hypoid Gear Lubrication," by H. C. Mougey, chief chemist, research laboratory division, General Motors Corp., Detroit; "Laboratory Equipment and Methods for Testing Lubricating Grease," by Ralph R. Matthews, Battenfeld Oil & Grease Corp., Kansas City, Mo.; "Roller Bearing Lubrication Problems," by Oscar Maag, lubrication engineer, Timken Roller Bearing Co., Canton, O.; "Lubrication Problems Presented by Different Types of Housing," by R. R. Reynolds, chief engineer, Fafnir Bearing Co., New Britain, Conn.; "Grease Lubrication Requirements in Steel Mills," by C. C. Pecu, lubrication engineer, Bethlehem Steel Co., Buffalo.

BOSTON CONFERENCE ON DISTRIBUTION ANNOUNCED

The ninth Boston Conference on Distribution is to be held at Hotel Statler, Boston, Sept. 20-21, with "Distribution Costs, Prices and Manpower" as the theme. This conference is sponsored by the retail trade board of the Boston chamber of commerce, in co-operation with Harvard university graduate school of business administration, Boston university college of business administration and Massachusetts Institute of Technology, and others.

Included in the more than 25 papers and addresses are two by executives in the metalworking industry. These are "Economic Effects of the Air Conditioning Industry," by L. S. Boulware, vice president and general manager, Carrier Corp.; and "Housing Developments in Relation to Distribution," by Arthur R. Herske, vice president, American Radiator Co.

FARM EQUIPMENT INSTITUTE CONVENTION TO BE OCT. 6-7

Several well-known speakers on farm subjects will address the forty-fourth annual convention of the Farm Equipment institute at the Palmer House, Chicago, Oct. 6-7. Among these are Dr. Glenn Frank, editor, *Rural Progress;* Clifford V. Gregory, associate publisher, *Wallace's Farmer and Iowa Homestead* and *Wisconsin Agriculturist;* C. B. Fritsche, managing director, Farm Chemurgic council; and S. G. McAllister, president, International Harvester Co.

Financial

BANKERS NOT ALARMED BY DECLINE IN STOCKS

Commenting on the current stock market flurry and declining prices of securities Col. Leonard P. Ayres, vice president of the Cleveland Trust Co., Cleveland, and Gen. Charles G. Dawes, former vice president of the United States, both close observers of business conditions, see no cause for alarm.

Col. Ayres believes the present weak situation is temporary and confined to our own market rather than one brought about by international conditions. He thinks American business men are suffering from a case of temporary jitters. "We have been having abnormally good business," he said, "and now that it is slackening a good many are disappointed." He added that business men have been confronted by many rules, regulations and conditions and are in a state of uncertainty.

Gen. Dawes said: "I see no indications in business of a lack of confidence and I expect to see business conditions continue satisfactory for this year and next. Setbacks in speculative markets in time of prosperity are to be expected."

NATIONAL STEEL CORP. DECLARES AN EXTRA

The board of directors of National Steel Corp., Pittsburgh, has declared a quarterly dividend of 62½ cents per share on the common stock, and in view of the federal surtax, authorized an additional payment of 50 cents per share, E. T. Weir, chairman, announced. There are 2,167,777 outstanding shares of stock and payment will be made Sept. 30 to stockholders of record on Sept. 20.

* * *

Midland Steel Products Co., Cleveland, declared dividends payable Oct. 1 of record Sept. 20, as follows: $2 per share on the 8 per cent cumulative preferred stock; 50 cents per share on the $2 non-cumulative dividend shares; 50 cents per share on the common stock.

* * *

Directors of Interlake Iron Corp., Chicago, declared the first dividend on common stock since March 25, 1931. The disbursement will be 40 cents, payable Sept. 30 to stockholders of record Sept. 18. The last previous dividend was 15 cents.

Labor

BETHLEHEM HEARING OPENS AT FRANKLIN BOROUGH, PA.

Hearing on the national labor relations board's complaint against the Bethlehem Steel Co. opened last week at Franklin borough, Pa. Mill workers and executives, city officials and civic leaders who organized the vigilantes during the strike appeared before Frank Bloom, trial examiner.

Bethlehem in reply to the board's complaint accused the board of making "vague and indefinite statements" and demanded a bill of particulars.

The company's total reply included four documents:

Motion by Bethlehem Steel Corp. that the complaint against it be dismissed, as it is a holding company not engaged in production or manufacture.

Denial of all allegations of unfair labor practices by Bethlehem Steel Co.

Motion for bill of particulars and extension of date of hearing to permit the company to study the charges and prepare defense.

Affidavit on behalf of the company protesting the board's action in making many charges of unfair labor practices without naming persons or specific instances, in calling a hearing on short notice over Labor day week-end, and in subpoenaing voluminous records and an extensive amount of information about the company's business which would take weeks to prepare.

The company pointed out that while it was summoned to a hearing Sept. 8, it had received no notice of this until Aug. 30, though the board sent notices to certain employe representatives in letters dated Aug. 20.

Weirton Hearing in Fourth Week

The Weirton Steel Co. hearing at New Cumberland, W. Va., was in its fourth week. Counsel for the company on several occasions sought to force the CIO to prove itself a qualified labor organization, but found the path blocked. The company presented payroll figures showing that the Weirton employes received an average pay increase of 10 per cent in 1934, 12 per cent last year, and 12.6 per cent in 1937.

At Canton, O., Chief Deputy Sheriff Richard France described at the Republic Steel Corp. hearing before Trial Examiner John T. Lindsay picketing conditions at Canton and Massillon during the CIO strike.

France said pickets were armed with clubs, iron pipes, ball bats and stones in both cities. He listed many complaints of violence.

Activities of Steel Users and Makers

FALK CORP., Milwaukee, maker of steel castings, herring bone gears and speed reducers, will concentrate its welding operations under one roof about Dec. 15 when a building, 114 x 308 feet, purchased from the Freese Engineering Co., Chicago, is moved from the foot of East Belleview place, Milwaukee, to the Falk plant site at West Thirtieth and Canal streets.

♦ ♦ ♦

Wire Rope and Strand Manufacturers association, Washington, has moved its office from 540 Woodward building to 627 Shoreham building.

♦ ♦ ♦

Iron & Steel Products Inc., Hegewisch station, Chicago, is dismantling the stamping plant of the Adventure Consolidated Copper Co., located near Houghton, Mich.

♦ ♦ ♦

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has appointed Uhrich Supply Co., Kansas City, Mo., distributor of seamless boiler tubes in the Kansas City, western Missouri and Kansas territory.

♦ ♦ ♦

Hanson Excavator Works division, Hanson Clutch & Machinery Co., Tiffin, O., has inaugurated the manufacture of skeleton trailers for use in transporting Hanson shovels, cranes and draglines.

♦ ♦ ♦

Emerson Electric Mfg. Co. Inc., St. Louis, has removed its Cincinnati office to 457 East Sixth street. Warehouse facilities for stocking of Emerson electric motors have also been provided. Jack Searls continues in charge.

♦ ♦ ♦

Tennessee Furniture Corp., Chattanooga, Tenn., now has in production at its refrigerator plant bottle coolers for the Coca Cola Co., oil heaters for the Quaker Mfg. Co. and the company's own line of Conditionaire refrigerators.

♦ ♦ ♦

Reed-Prentice Corp., Worcester, Mass., will handle sales of plastic injection molding machines direct in the New York territory, with headquarters at 75 West street, New York. George W. McIntyre is manager.

♦ ♦ ♦

Newport News Shipbuilding & Dry Dock Co. has moved its purchasing offices from New York to Newport News, Va. A skeleton force may be retained at New York for handling certain minor supplies, it is said.

♦ ♦ ♦

Clowe & Cowan Inc., Amarillo and Lubbock, Tex., has been appointed distributor by Babcock & Wilcox Co., New York, to handle its line of seamless tubular products in the Texas Panhandle, South Plains and eastern New Mexico.

♦ ♦ ♦

Viking Pump Co., Cedar Falls, Iowa, has opened a branch sales office at Milwaukee. Clark Mullens, sales manager of the company for several years, will be in charge of the new office. The company recently opened a branch office at Indianapolis, Ind.

♦ ♦ ♦

Standard Electric Stove Co., Toledo, O., because orders are coming in faster than they can be executed on the basis of present production, has launched a comprehensive expansion program. Plant additions are under construction and new machinery is being installed.

♦ ♦ ♦

Clark Controller Co., Cleveland, has let contracts for erection of a second story addition containing 1200 square feet, to provide more space for the development, research and engineering departments. The addition was made necessary by the increased demand for electrical control equipment. This follows closely upon the heels of another two-story addition of about 800 square feet, which will provide more space for the spray painting department.

Trailer Becomes a Real Home

A TRAILER cottage, designed as a permanent home, to aid in solving the housing shortage, has been designed and placed in production by Covered Wagon Co., Mt. Clemens, Mich. In 14 and 20-foot lengths it is planned so that two or three units may be combined to form a single dwelling. Standard equipment includes enamel sink and work board, ice box, cook stove, bath and closet space. Plumbing is designed for connection with city water systems. Chassis is of steel channels with nickel steel drop center axle and the drawbar is a steel box girder, with coupler and ball socket

Steel Shipments Best For August Since 1929

Shipments of finished steel by the United States Steel Corp. in August totaled 1,107,858 tons, a decline of 78,894 tons from the July figure, and an increase of 184,155 tons over August, 1936. For eight months of 1937 total shipments were 9,908,844 tons, compared with 6,905,904 tons in the corresponding period of 1936. August shipments this year were the highest for that month since August, 1929, when they were 1,360,000 tons.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	1,343,644	979,907	591,728	643,009
May	1,304,039	984,097	598,915	745,063
June	1,268,550	886,065	578,108	985,337
July	1,186,752	950,851	547,794	369,938
Aug.	1,107,858	923,703	624,497	378,023
Sept.	.....	961,803	614,933	370,306
Oct.	.....	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj.	.....	†40,859	†23,750	†19,907
Total	.....	10,784,273	7,347,549	5,905,966

†Deduction.

Men of Industry

WILLARD S. HARING has been appointed vice president in charge of sales, Alan Wood Steel Co., Conshohocken, Pa. He succeeds Arthur L. Meyer, resigned. Mr. Haring has been vice president in charge of western sales since 1929, following several years in Conshohocken as general manager of sales. He will take over his new duties on arrival in the East about Sept. 20.

P. L. Francis, formerly district manager at Seattle, will succeed Mr. Haring on the West coast, with headquarters at Los Angeles.

♦ ♦ ♦

N. J. Ranney has left Ferro Enamel Corp., Cleveland, to join the Wean Engineering Co., Warren, O.

♦ ♦ ♦

T. E. Millsop, president, Weirton Steel Co., has been elected to the board of directors of National Steel Corp., of which Weirton is a unit.

♦ ♦ ♦

J. C. Harvey has joined the Westcott Chuck Co., Oneida, N. Y. He will act as special representative for the company, and will work with Westcott distributors in the various territories.

♦ ♦ ♦

J. M. McKibbin Jr., associated with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., since 1922, has been appointed apparatus advertising and sales promotion manager of the company.

♦ ♦ ♦

Alfred C. Goins has been appointed assistant superintendent of cold reduction at the Gary sheet mill of Carnegie-Illinois Steel Corp. He succeeds Arno L. Billeter who has been transferred to the new Irvin works in the Pittsburgh district where he will have charge of the cold reduction department. Other appointments made at the Gary sheet and tin mills are Peter J. Nebe who is the new annealing superintendent at the tin mill; Joseph Taylor, who has become plant photographer, and John E. Soyring night superintendent of the annealing department in the tin mill.

Arno L. Billeter

Willard S. Haring

♦ ♦ ♦

Paul G. Leoni, president, Iron & Ore Corp. of America, New York, sailed last week for Europe, to be gone about two months. His itinerary includes several western European countries.

♦ ♦ ♦

F. L. Coyne has been appointed manager, Cleveland branch of Sterling Wheelbarrow Co., Milwaukee. He was associated with the Chicago office for the past ten years, and in his new capacity succeeds the late J. M. Dickson.

♦ ♦ ♦

G. Howard Boddy, with offices in the General Motors building, Detroit, has been appointed representative for Blaw-Knox Co., Pittsburgh, to handle engineering and sales for Power Piping Corp., a subsidiary.

♦ ♦ ♦

C. H. Boenig, of Youngstown, N. Y., has been appointed sales engineer by Harnischfeger Corp., Milwaukee, to handle the company's entire line of products in the western section of New York.

♦ ♦ ♦

B. C. Moise, executive vice president, National Tube Co., Pittsburgh, was injured Sept. 4 when struck by lightning while on a Pittsburgh golf course. Donald H. Baum, secretary, Mackintosh-Hemphill Co., escaped injury.

♦ ♦ ♦

Jack Ryan and William Rosser have become associated with Iron & Steel Products Inc., Chicago, as special sales representatives. They will be located at the company's city sales office, 657 Railway Exchange, Chicago.

♦ ♦ ♦

J. M. J. Keogh, who entered the office of the former E. P. Allis Co., Milwaukee, as a boy of 15 in 1881, and rose to assistant to the general works manager of its successor, the Allis-Chalmers Mfg. Co., has been retired under its pension system at the age of 71.

♦ ♦ ♦

Charles E. Fouhy, who has specialized in employment problems for 20 years, and was formerly president, Industrial Management association, Elmira, N. Y., has joined the staff of the personnel training division, International Correspondence Schools.

♦ ♦ ♦

Wayne Z. Friend has joined the development and research staff of International Nickel Co. Inc., New York. He will devote his time to technical service on corrosion resisting materials. His experience has been principally in the petroleum and natural gas industries.

♦ ♦ ♦

C. D. Hollins, 2132 Morse avenue, and C. P. Guion, 1661 Milwaukee avenue, both at Chicago, have been appointed representatives by Hammond Machinery Builders Inc., Kalamazoo, Mich., to handle the sale of grinders for foundry use in Wisconsin, Illinois, Iowa and Indiana.

♦ ♦ ♦

Harry L. Brindle, assistant general superintendent in the Youngstown, O., district for Carnegie-Illinois Steel Corp., has been named acting general superintendent of Edgar Thomson works, Braddock, Pa. He succeeds Frank F. Slick who was granted an indefinite leave of absence due to a lengthy illness, as noted in STEEL, Sept. 6, page 34. Mr. Brindle is completing 32 years of continuous service with the company in which he rose from roll turner at the New Castle, Pa., works to his present position.

He will be succeeded at Youngs-

Harry L. Brindle

town by Fred B. Loveland, superintendent of the rolling mills of Ohio works since 1933. Mr. Loveland began his career with United States Steel subsidiaries in 1906 as a clerk in the Greenville, Pa., plant of National Tube Co.

♦ ♦ ♦

M. W. Lade, Chicago, has been elected treasurer and a vice president, Globe-Union Inc., Milwaukee, maker of roller skates, spark plugs, radio parts, and storage batteries. W. B. Fyffe, formerly treasurer, has been named secretary to succeed T. B. Ingalls, resigned.

♦ ♦ ♦

L. L. Brenholts has been elected president, Harris Pump & Supply Co., succeeding Harry E. Cole, resigned. He formerly was associated with Pittsburgh Gauge & Supply Co. S. S. Weisiger Jr. has been advanced from credit manager to secretary-treasurer, F. A. Haring continues as vice president.

♦ ♦ ♦

Fred A. Hahn, president, Fred A. Hahn Co., investment brokerage firm, Chattanooga, Tenn., and Dean B. Copeland, vice president and director, Butler County National Bank & Trust Co., Butler, Pa., have been named to the board of directors, American Bantam Car Co., Butler.

♦ ♦ ♦

Francis W. Magin, Milwaukee, president, Square D Co., Detroit and Milwaukee, maker of electric switches and controls, has been elected a director of the Hein-Werner Motor Parts Co., Waukesha, Wis., manufacturer of hydraulic jacks and other automotive specialties.

♦ ♦ ♦

Angus G. Scott, formerly superintendent of power distribution for Cleveland Railway Co., Cleveland, has been appointed manager of Westinghouse Electric & Mfg. Co.'s newly created department specializing in line materials for mining, street railway systems and heavy electrifications. He will be located at East Pittsburgh, Pa.

♦ ♦ ♦

Leonard J. Lewery has joined the sales organization of J. Harvey Bryan, 50 Church street, New York. In this capacity he will handle the products of the Apollo Steel Co., Apollo, Pa.; Bliss & Laughlin Inc., Buffalo, and Harvey, Ill.; and the Thomas Steel Co., Warren, O. Mr. Lewery was recently connected with the Reynolds Corp., New York, and prior to that, Wheeling Steel Corp., Wheeling, W. Va.; United States Steel Products Co., New York, and American Rolling Mill Co., Middletown, O.

♦ ♦ ♦

Frank H. Carter, Dietrich Bros. Inc., was elected president of the Steel Club of Baltimore when the club resumed its second year's activities with a dinner meeting Sept. 10 at the Lord Baltimore hotel, Baltimore.

The club, a social organization, formed in April, 1936, with a membership of 22, now has 42 members, who are representatives of steel mills, fabricators and jobbers. Except for the summer season, meetings are held every other month during the year.

Other officers for the ensuing year are Charles S. Duvall, Maryland Bolt & Nut Co., vice president, and Charles W. Test, Youngstown Sheet & Tube Co., secretary and treasurer.

Directors are J. E. Aldridge, Bartlett Hayward division of Koppers Co.; Harold K. Dell, John J. Greer

Frank H. Carter

& Co. Inc.; E. J. Maher, Dietrich Bros. Inc., and C. H. Michael, Maryland Metal Building Co.

The entertainment committee is comprised of J. B. Coster, Bethlehem Steel Co.; H. Rodgers Dorney, Jones & Laughlin Steel Corp., and C. H. Michael; membership committee, Marshall Carleton, Central Railways Supply Co.; Victor A. Jevon, Bethlehem Steel Co., and J. Stuart McKenzie, John McKenzie & Co. Inc. J. B. McIntyre, Scully Steel Products Co., is in charge of attendance.

Died:

G A. BINGENHEIMER, 70, chairman of the board, Diamond Iron Works Inc., and its subsidiary manufacturing division, Mahr Mfg. Co., Minneapolis, in that city, Aug. 27. He became associated with the company as manager and rose by successive promotions to the presidency, a post he held for 35 years, until about a year ago.

♦ ♦ ♦

Walter C. Greene, 52, Ohio manager of Nash Engineering Co., heating and ventilating equipment manufacturer, in Cleveland, Sept. 3.

♦ ♦ ♦

Harry Sayre Schott, 52, vice president in charge of sales and advertising, National Carbon Co. Inc., New York, in Montclair, N. J., Aug. 3.

♦ ♦ ♦

Charles A. Wilhoft, 71, for 34 years with the New York Belting & Packing Co., a subsidiary of the United States Rubber Co., New York, at his home in Bloomfield, N. J., Aug. 31.

♦ ♦ ♦

William E. Marchant, 52, automobile designer credited with being the originator of the coach-type body, and for the past seven years active in the machinery business in Detroit, in that city, Sept. 4.

♦ ♦ ♦

George O. Orr, for 58 years an employe of Jones & Laughlin Steel Corp., Pittsburgh, in Pittsburgh, recently. At one time manager of the former price department, Mr. Orr recently had been in the hot-rolled sales department.

♦ ♦ ♦

James M. Austin, 43, Pittsburgh district manager, National Refractories Co., Sept. 1, in Pittsburgh. He had been with National Refractories since it was organized Sept. 1, 1935, and previously had been with General Refractories Co.

♦ ♦ ♦

Lewis W. Hicks Jr., assistant secretary-treasurer, Allegheny Steel Co., Brackenridge, Pa., a grandson of Capt. Alfred E. Hicks, who founded Allegheny Steel, was killed Sept. 4 on a Pittsburgh golf course when struck by a bolt of lightning.

♦ ♦ ♦

Arthur W. Wellman, 81, retired founder and president, Capitol Wire & Fence Co., now the Capital Wire Co., Madison, Wis., Sept. 2. He settled in Madison in 1899 as field representative for American Steel & Wire Co., later establishing his own business.

♦ ♦ ♦

Maurice Coster, 82, former vice president, Westinghouse Electric International Co., Sept. 1 at Magog, Que. He retired in 1930 after being associated with Westinghouse since 1888. He was one of the founders, American Manufacturers Export association.

♦ ♦ ♦

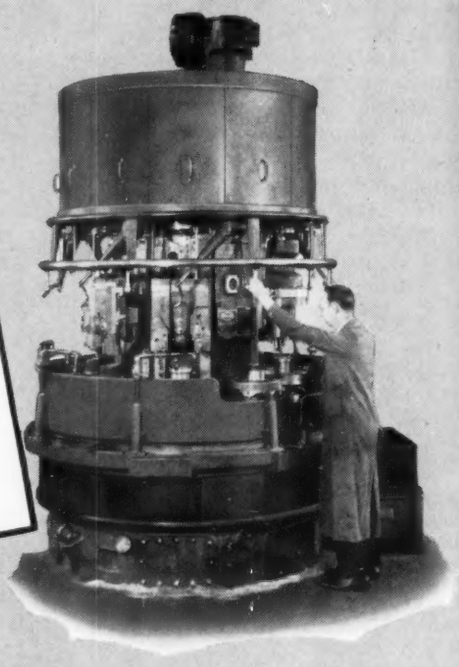
Prof. Herman Diederichs, 63, dean of engineering, Cornell university, Ithaca, N. Y., Aug. 31 at Clifton Springs, N. Y. He became dean of engineering last year. He was first president, American Society of Mechanical Engineers, and was also a member, Society of Automotive Engineers.

NIGHT LETTER

ED. PURCHASE
AUTOMOTIVE MANUFACTURING COMPANY
AUTOMOBILE CITY, MICHIGAN

VISITED BULLARD COMPANY TODAY STOP WATCHED JOBS RUN OFF ON TYPES J AND D MULT-AU-MATICS STOP RIGIDITY OF MACHINES EXCEPTIONAL STOP RANGE FEEDS AND SPEEDS TAKES FULL ADVANTAGE OF METALLOID CUTTING TOOL POSSIBILITIES STOP THESE ARE PRECISION MACHINES WITH COST CUTTING POSSIBILITIES PLUS STOP ADVISE IMMEDIATE ORDER OF ADDITIONAL EQUIPMENT BASED ON BULLARD ESTIMATES STOP FAST ACTION NECESSARY IF EARLY DELIVERY DESIRED

JOHN METHOD
CONSULTING ENGINEER



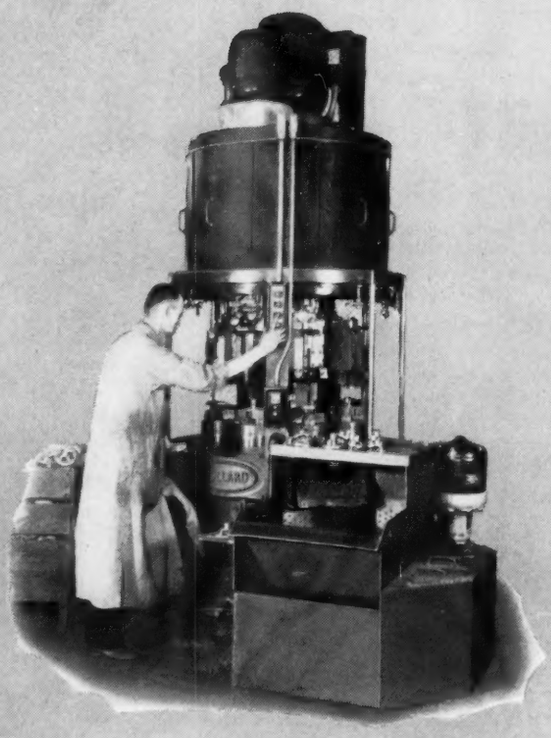
IF you know Mult-Au-Matics and their Performance record, you will agree that John Method's lengthy wire was Good Business.

JOHN METHOD obviously believes that additional Profits can be derived by concentrating on the Mult-Au-Matic Method of machining.

IF you DON'T know about the Mult-Au-Matics, we invite your investigation.

IF OTHERS CAN PROFIT WITH MULT-AU-MATICS, SO CAN YOU

Ask for Bullard Estimates on your work



THE BULLARD COMPANY

BRIDGEPORT **CONNECTICUT**

MIRRORS OF MOTORDOM

DETROIT

MORE than they would care to admit, automobile manufacturers are being plagued by delays in receipt of parts and material, in equipment installation, and in finishing up tools and dies for new models. While such delays are not unusual, and in fact schedules usually are drawn up in anticipation of them, they are proving more and more vexing to car builders who are pushing hard to get an early jump on the 1938 season.

Packard has bumped into one delay after another, mainly on sheet steel work, and has encountered a number of unexpected difficulties in changing over its lines, with the result it still is not in full production on new models, whereas recently Packard was being touted as in position to lead the parade on 1938 designs.

Packard is credited with featuring a new type of rear springing, probably not of the coil type such as Buick is introducing, but some modification of the semi-elliptical design. Rumors of rear coil springs on 1938 Packards are not given much attention, since they would imply a complete redesign of the rear end drive mechanism, and no extensive change has been made in the latter. At the present stage, it appears the most important aspect of the Packard line will be the roomier, steel-topped bodies.

The new Packard radio program made its bow last week and drew much favorable comment here for its high talent quality and minimum of commercial chatter.

HUDSON, scheduled to offer a preview of new models to the press this week, also has become enmeshed in delays on dies which have set back its schedules somewhat, with the result assembly lines probably will not resume much before the end of this week. Anticipating a barrage of publicity over automatic transmissions and automatic gearshifts from other builders this fall, Hudson is "pointing with pride" to its selective automatic gearshift introduced three years ago and already supplied on more than 150,000 cars.

BY A. H. ALLEN
Detroit Editor, STEEL

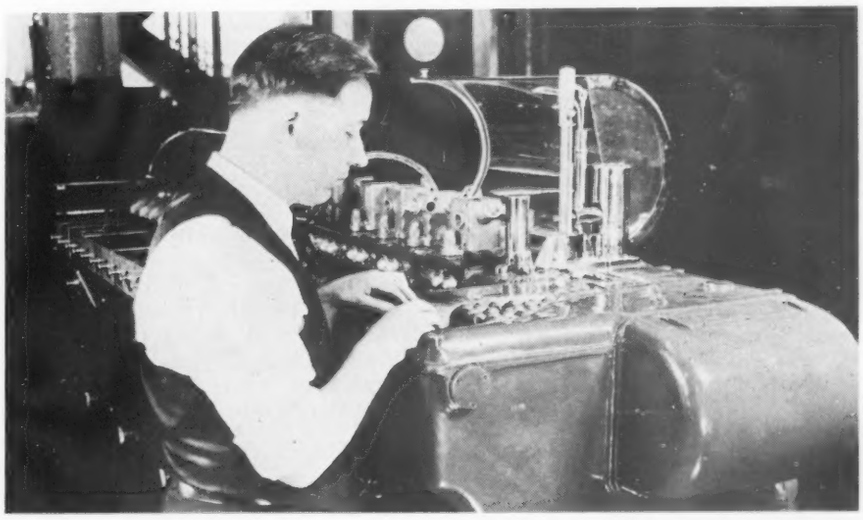
Introduced First by Hudson

The merchandising staff is making much of the fact Hudson was first to introduce this type of transmission which provides full control of gear shifting from the steering wheel.

Scrap metal has been coming from the Hudson body plant for the past two weeks, so apparently this division is in good shape on bodies for new models.

Hupmobile is another to run afoul of delays on material and parts, but latest word is new model production will start sometime this week. Press preview was held at a country estate near here last week. The new line will be offered on two chasses—122-inch and 125-inch wheelbases—a six and an eight, each with three body styles. Cylinder block and crankcase are of heat-treated chrome-nickel alloy cast iron. Crankshafts are forged steel. Aluminum pistons with invar struts, dual carburization and manifolding and vacuum spark control are other features. An overdrive is standard on the eight and optional on the six. Alligator type hood lifts at the front. The radiator

Inspection Robot Sees and Hears



AUTOMATIC inspection machine makes use of a photoelectric cell, radio amplification and mechanical fingers to subject Ford V-8 valve pushrods to 11 separate tests to check hardness, dimensions and freedom from flaws. Hardness is measured by the scleroscope method, the rebounding weight intercepting a light beam. Hidden flaws are detected by a microphone and amplification system which "listens" to the pitch and duration of sound produced by striking rod with small hammer. Nine following operations check dimensions. The machine inspects 42 rods per minute

MIRRORS OF MOTORDOM

ornament will serve as a handle.

Nash tentatively has scheduled 600 new models daily and began last week on this basis. Important feature available on the 1938 Nash is an air conditioning unit located under the dash and operated electrically through a button on the dash. The unit is about 3 inches high, 12 inches wide and 12 inches deep, operating in conjunction with the cowl ventilator to provide a continuous supply of fresh air to the interior. It is claimed that with all windows closed, five persons can be smoking in the car and the conditioning unit will remove all smoke fumes.

Installs Additional Equipment

As intimated in this department some weeks ago, Nash interiors are set off strikingly with instrument panels and hardware of molded plastic in color. Hardware combines die castings with plastics and is sharply "streamlined." A large program of equipment expansion at the Nash plants in Milwaukee, Racine and Kenosha has been practically completed, and will facilitate stepping up production this fall. Additional press equipment has been installed at the Seaman body plant of Nash in Milwaukee and new conveyors eliminate trucking between departments.

Recent appointment of Ray DeVlieg as plant manager for Nash has rekindled the speculative fires concerning the eventual transfer of Nash operations to the Detroit district. DeVlieg is a Detroit man, formerly active with Kelvinator, and close to George W. Mason, president of Nash-Kelvinator. It is believed he would like to see Nash operations brought into the Detroit area, but considering that two millions have just been spent in refurbishing the Wisconsin plant, any Detroitward move is unlikely, at least for a few years. However, it is considered a good hunch Nash eventually will move this way to bring it into closer association with its new brother, Kelvinator. It is even possible some integration of facilities could be worked out between the automobile manufacturer and the refrigerator builder.

Speaking of refrigerators, the Frigidaire division of General Motors at Dayton, O., announced last week a program of electric range manufacture to take up the slack in off-seasons for refrigerators, both for the plant and for dealers. Other large refrigerator builders have made this move and have found it an ideal step to round out yearly schedules. Frigidaire has purchased all necessary equipment for the new line, and started manufacture.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,775
7 mos.	2,674,825	3,045,714	3,374,195
Aug.	245,075	275,934	*370,000
Sept.	92,728	139,820	.....
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
Aug. 14	103,250
Aug. 21	93,339
Aug. 28	83,310
Sept. 4	64,200
Sept. 11	59,017

	Week ending Sept. 11	Sept. 4
General Motors	23,096	26,600
Ford	26,000	26,000
Chrysler	2,100	5,800
All others	7,821	5,800

*Estimated.

FAILURE of equipment suppliers to meet delivery dates is the reason ascribed to Ford's postponement of rebuilding three open-hearth furnaces and constructing a new blast furnace. Numerous contracts have been let for the work and material and equipment ordered, but it now appears actual work will not develop before the first of the year. Ford engineers are reported active in sketching up plans for a new body plant at the Rouge, which, so one is told, will be a structure of amazing length.

Meanwhile, Ford will pull the switch on 1937 assemblies some time this week, outdistancing earlier predictions, and adding considerable bulk to August and September production totals. Banks of parts for new models are being built up, some at the rate of 5000 per day, but deferring of some material shipments until the end of the month suggests it will be early in October when the first new Fords appear.

A fantastic account which can be added to the present storehouse of Ford legends has made its appearance lately. It concerns the buyer of a Ford V-8 who allegedly received a new Lincoln Zephyr and $500 for his car which was averaging some 39 miles to the gallon and was said to have been termed by Ford engineers an "experimental engine which was installed by mistake." Apparently well authenticated, nevertheless the tale is dismissed by Ford executives who should be in a position to know. Even without their word, it is inconceivable how such an engine, granting the stated economy were possible, could pass the eagle eyes of the corps of inspectors and testers on the motor line at the Rouge plant. However, it makes interesting conversation and just so much more publicity for Ford who has never been one to lack for mention.

Fruehauf Plans New Building

Plans for a new single-story building providing 65,000 square feet of floor space have been drawn up by Fruehauf Trailer Co. here to furnish additional manufacturing space. Fruehauf has been expanding steadily each year for the past several years and finds its present trailer manufacturing facilities on Harper avenue becoming cramped. The new structure will be located across the street from the present location.

Equipment includes heat-treating furnaces for alloy steel axles, a new paint spray shop, lathes and grinders for axles, a pressed metal shop, and a final inspection division. The paint shop and stamping equipment will be moved out of present quarters and additional units purchased to enlarge these divisions. Two overhead cranes with 40-foot span will be provided. Work is scheduled to be completed by Dec. 1.

HIGHLIGHTS of Labor day in Detroit: For the first time since 1916, a Labor day parade was held. According to police count, marchers totaled 7392, not counting those in 65 automobiles, 10 taxicabs, 58 trucks and 10 floats. It was made up largely of representatives from various UAW locals and a scattering of AFL locals. The UAW parade director claimed at least 25,000 in the parade; his eyesight was poor.

Homer Martin, UAW president, made two speeches, one at Belle Isle and the other at Jefferson Beach. The crowd numbered less than 1000

(*Please turn to Page* 107)

WINDOWS OF WASHINGTON

WASHINGTON

HOOKING fair trade practices for industry to wages and hours legislation, when congress again convenes, appears probable. It is reported work along this line is already under way. With the wages and hours bill having passed the senate and been reported by the house committee on interstate commerce, it apparently will be necessary to change the legislation on the house floor and then send it to conference.

This would appear to leave the senate nothing to do but acquiesce in the house action. Some other legislative way may be found—such as entirely discarding the action that already has been taken by both houses and starting all over again. This would take considerable legislative juggling but can be done.

Two bills may be introduced, one to set up fair trade practices and the other to empower a board to fix wages and hours, similar to the legislation which already has been passed. Of course, this was the original idea, but the administration gave up the fair practices plan and went in directly for the hours and wages. Apparently officials again have had a change of heart and are ready to go ahead with the trade practice angle.

Voluntary Codes Planned

In the wages and hours legislation already started, exemptions are made for certain industries. Now it is reported these exemptions will be eliminated. The 40-40 proposition, however, probably will be left as it is, a minimum of 40 cents an hour and a maximum 40-hour week.

According to meager reports available, the plans not yet having gone very far, the fair trade practice bill would provide for voluntary agreements among units in various industries. Industries having such agreements would receive advantages, it is claimed. Also they would be in a position to agree among themselves on wage and hour standards.

BY L. M. LAMM
Washington Editor, STEEL

Present plans call for joint administration by the department of commerce and the federal trade commission. The commerce department would consult industries in drafting agreements and would offer any aid requested by industry. Then the trade commission would decide on the agreement's legality and would rule on violations. All of this savors strongly of the old NRA and it is possible industry may be so set against it that even the administration cannot force it through. Anyhow, government officials are thinking along this line, apparently at the President's request.

DEFICITS CARRY NATIONAL DEBT TO RECORD ALTITUDE

Recurrent operating deficits, a steadily mounting public debt and increasing interest charges long have troubled taxpayers thoughtful for the morrow. Repeated protests on the extravagant spending policies of the present government have arisen—often from within the New Deal ranks.

Fiscal year 1937 was the seventh successive year in which the federal government incurred a substantial deficit, the National Industrial Conference board reports. With the exception of 1936, expenditures were larger than for any other year of the period of deficit financing. Excluding expenditures related to payment of the veterans' bonus in 1936, 1937 spending was larger than any other peace-time year.

Receipts also increased in 1937 but failed to equal the increased expenditures.

Rapidity of the rate of increase is revealed by comparative expenditures for the past nine years: 1929, $3,848,500,000; 1930, $3,994,200,000; 1931, $4,220,000,000; 1932, $5,274,300,000; 1933, $5,306,600,000; 1934, $7,243,700,000; 1935, $7,541,800,000; 1936, $9,084,900,000; 1937, $8,339,000,000.

These figures include public debt retirements and tax refunds.

Gross debt at the close of fiscal 1937 amounted to $36,425,000,000, an increase of $2,646,000,000 for the year. This total was 37 per cent larger than the pre-depression peak of $26,597,000,000 reached on Aug. 31, 1919. It exceeds the post-war low of $16,026,000,000 reached on Dec. 31, 1930, by 127 per cent.

Gross debt less the net balance in the general fund amounted to $33,871,000,000 on June 30, an increase of $2,774,000,000 over the comparable total on June 30, 1936. The policy of buying gold and carrying it in the general fund on an inactive basis has tended to increase the gross debt and widen the margin between gross debt and gross debt less the net balance in general fund. The treasury, of course, is paying interest on a comparable amount of indebtedness for the purpose of carrying this gold as an inactive item.

BUDGET BALANCING NOT EASY WITH FAST SPENDING

Interest payments for the last fiscal year totaled $866,000,000, highest in the period of deficit financing. For the past eight years, interest payments have been as follows: 1930, $659,300,000; 1931, $611,600,000; 1932, $599,300,000; 1933, $689,400,000; 1934, $756,600,000; 1935, $820,900,000; 1936, $749,400,000; 1937, $866,400,000. For 1936 interest payments were lower than for either 1935 or 1934. This decrease in the face of increasing indebtedness resulted from the refunding of outstanding issues at lower rates and low rates on new issues.

Average rate of interest paid was reduced from 3.807 per cent in 1930 to 2.582 per cent in 1937. This rate multiplied by the interest-bearing debt of $35,800,000,000 on June 30 indicates an annual interest charge of $924,000,000.

"If one lesson has been learned as a result of the events of the last few years, it is that balancing the budget at a level in excess of $7,000,000,000

is not an easy task, even though additions to the revenue system are made in a period of recovery. The transition from a liberal-spending policy to a policy of retrenchment is at best difficult," the board's report concludes.

"For this reason, too much importance should not be attached to the attempt to reduce expenditures at the request of the executive. It is a significant step, but the actual economies effected may be offset by the failure of receipts to come up to expectations or by expenditures for purposes not included in the budget.

" . . . . It has been stated that in order to balance the budget without undue delay, balancing the budget would have to be made the one central or key policy of the administration, to which other policies were subordinated.

"At the present it cannot be said the attainment of a balanced budget is so regarded. There has been significant change in attitude, as a result of which one can say the early attainment of a balanced budget is one of the principal objectives.

" . . . . It is not yet possible to state definitely when either the so-called layman's balance or a completely balanced budget on a basis that includes debt retirement will be achieved."

EARLY TO QUIT? RUMORS GROW MORE PERSISTENT

Every few months it is rumored about Washington that "Steve" Early, press secretary for President Roosevelt will resign. The rumor now appears more persistent than ever. Now it is only a question of waiting for the best time to leave the boss.

Current reports are that he will go with a New York publicity firm as an associate—and the firm is named.

Steve will leave his present job with reluctance and the President will be sorry to lose him; they have been the best of friends since Mr. Roosevelt was assistant secretary of the navy. Then Steve was covering the navy department for the Associated Press and so came into daily contact with Mr. Roosevelt.

Some of the Washington correspondents do not get along too well with Steve; in many instances that is not his fault. For instance when the President nominated Senator Black for the Supreme Court one noon, Steve just had concluded his press conference and had told the reporters a lot of names were under consideration and it probably would be sometime before the justice would be named. A few hours later the President named Black.

On the surface it appeared Steve was misleading the "boys." This was not so, however, because the President had not even told Steve who would be nominated. In explanation the President told his regular weekly press conference the same afternoon, the conference was late because he and Steve were explaining to each other what had happened.

NEW DEAL-CIO HONEYMOON APPARENTLY NEAR END

The honeymoon of the administration and John Lewis' CIO, if one ever existed, is apparently at an end. This repeatedly has been forecast in this column. It is confirmed in the recent radio address by Lewis in which he warned the President to either back his organization or face a labor bolt.

On the other hand, the President apparently cracked back at Lewis a few days later in a Labor day statement which, it is said, was written before the Lewis broadcast. However, be that as it may, it was very much to the point and interested parties have read into the President's pronouncement a crack at Lewis, by his assertion strikes must go. Of course, the Chief Executive did not take any side with industry. Far from that, he charged both sides have erred—but the fact he blamed some of the trouble on labor is interesting.

Lewis asserted the CIO is here to stay. "It is now and henceforth a definite instrumentality," he said, "destined greatly to influence the lives of our people and the internal and external course of the republic."

A considerable portion of his talk was devoted to the steel industry and his attempted strikes. "In the steel industry," said Lewis, "the corporations generally have accepted collective bargaining and negotiated wage agreements with the CIO."

Lewis warned members of congress and even the President, without naming him, that they must be good.

"The objectives of this movement (CIO) are not political in a partisan sense. Yet it is true that a political party which seeks the support of labor and makes pledges of good faith to labor must, in equity and good conscience, keep that faith and redeem those pledges. The spectacle of august and dignified members of congress, servants of the people and agents of the republic, skulking in hallways and closets, hiding their faces in a party caucus to prevent a quorum from acting upon a labor measure (the hours-wages bill), is one that emphasizes the perfidy of politicians and blasts the confidence of labor's millions in politicians' promises and statesmen's vows."

AFL GOES ON WARPATH FOR HIGHER WAGES FOR WORKERS

That the American Federation of Labor is on the warpath for more money for workers becomes increasingly obvious. In a recent statement it says "rising costs of living make wage increases urgent." It goes on to say "any worker whose pay envelope this fall does not bring him 5 per cent more than last fall will be forced to a lower living standard."

Economists of the labor union claim "workers whose pay envelope is not more than 5 per cent above last year, although they can keep the same living standard, however, will fall behind in the march of progress. For production per worker has increased so rapidly during recovery that our industries today can produce a higher living standard for each family than they did two years ago. . . .

"We cannot know exactly how much the average pay envelope should increase this fall to keep pace with modern industrial progress, for the United States government has not yet developed records to give an accurate measure of the worker's increasing power to produce year by year. We do know that from 1929 to 1935 production of all goods and services per employe increased 10 per cent, even though the work week was shortened from an average of about 49 hours in 1929 to 39 hours in 1935. We know also that production per employe per year has increased considerably since 1935."

The federation in a tabulation shows in the steel industry from the first half of 1935 to the first half of 1937 the increase in production per worker per week was 36 per cent, that the weekly wage increase in the same period was 48 per cent and the hourly wage increase was 20 per cent while the increase in production cost due to the higher wage was 4 per cent.

INFLATION THREAT AGAIN RAISED BY SENATOR THOMAS

Having successfully dodged the inflation question for several years, the President will face the issue again at the coming session, it is indicated by Senator Elmer Thomas of Oklahoma. Thomas announced before he left Washington he will offer a monetary stabilization bill as a proposed amendment to the general farm bill which will be the first order of business at the next session. Thomas has held this bugaboo before the country for years.

"It is impossible," said he, "to enact any satisfactory farm legislation until the regulation and stabilization of the dollar has been accomplished.

"There have been misleading and incorrect statements made relative to the objective of the monetary authority bill. The proposed legislation is very simple. It proposes to vitalize the constitutional provision which gives congress the power to regulate the value of money."

Editorial

Is Business More Sensitive To Bearish News

LARGELY through the unfortunate timing of a series of disconcerting events and statements, the business world, returning to work after a three-day holiday, last Tuesday plunged headlong into a gloomy atmosphere instead of into the "now-let's-get-down-to-brass-tacks" spirit which usually prevails after Labor day.

One should not place too much emphasis upon the bearish sentiment which existed in the early part of last week. Probably, by the time these words are read, the outlook will have cleared considerably and the factors which contributed to the momentary spell of uneasiness will have been analyzed and interpreted more accurately than was the case last Tuesday and Wednesday.

But it is worth while to study the condition of nervousness and its causes. Perhaps such examination will shed light upon the changes that have occurred in our economic, political and social structures and will provide lessons for future guidance.

Labor and Tax Situation, Added to Unbalanced Budget, Potent Factors in Face of War Scare

Some of the factors which contributed to the jittery feeling in financial circles and to a limited degree in industry were of long standing. The failure of the federal administration to do anything of importance in cutting government expense or in starting to balance the budget is a cloud on the economic horizon—and one that can be counted upon to weigh heavily whenever the public becomes panicy because of other developments. The federal financial situation, in the present instance, proved to be a convenient black drop curtain for other factors in a dingy setting.

On one side of this setting was the labor situation in the United States. The words of President Roosevelt, John L. Lewis, William Green and Madden, all delivered in connection with the observance of Labor day, were words of venom and hate and not words of constructive action or of the co-operative spirit which must prevail if we are to advance steadily in our labor relations. Nothing that was said by these four was conducive of hope or encouragement in the minds of employes, employers and stockholders who are immediately concerned with labor conditions.

Another figure in the setting was the specter of rising costs—an ethereal being on the stage whose presence was felt rather than seen. It was the intangible result of added burdens of taxation, social security, relief, and dozens of other items of expense.

Many other figures appeared vaguely in the picture. There was the still backward building industry, throttled by racketeering, old methods, labor and jurisdictional strife, obsolete financing, etc. Present also was the railroad situation, with the menace of exhorbitant wage increases and legislation restricting operating economies.

But the outstanding figure was Mars, who strode across the stage with rattling armor and dangling sword, symbolizing the implications of Hitler's recent utterance in regard to the common bond of interest between Germany, Italy and Japan; of the blustering exchange of notes between Russia and Italy; of the potential dynamite in the Mediterranean mess and in the Sino-Japanese conflict. The war scare was the factor which put life into the otherwise inactive scene of passive figures.

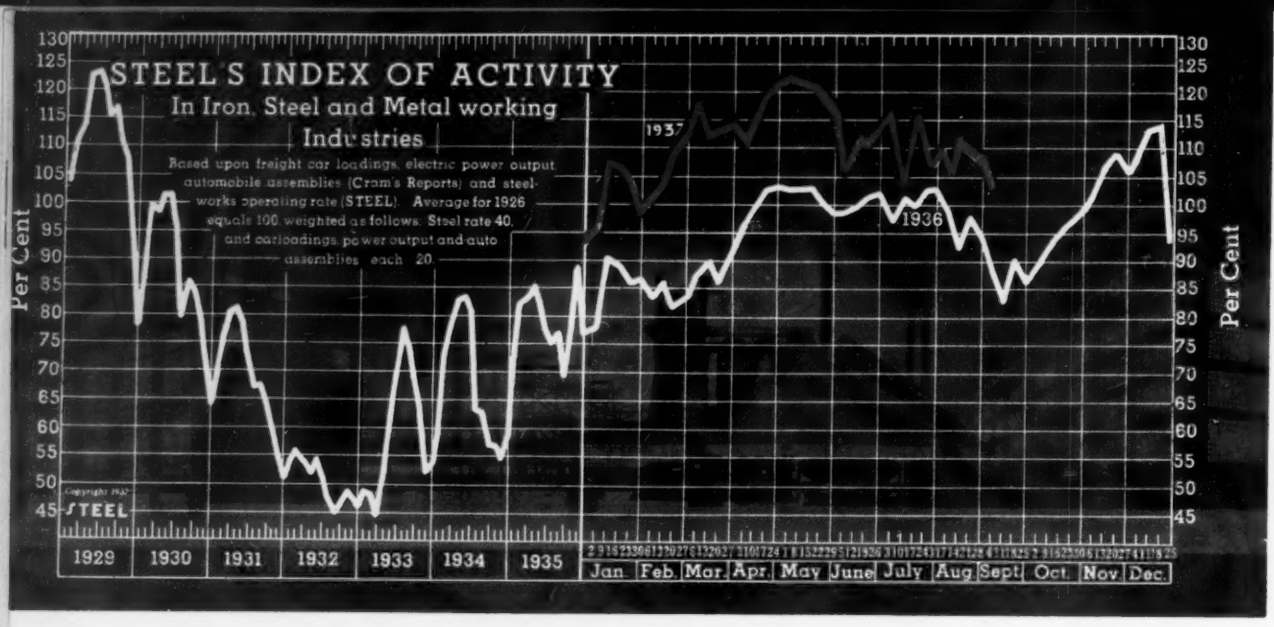
Bright Side of Picture, with New Production Records, Overlooked in Attack of Jitters

It is not surprising that financial men and some industrialists, viewing this dismal picture last Tuesday morning, suffered a touch of discouragement. Momentarily it obscured the many favorable factors in the domestic situation. They forgot the remarkable activity of industry in the second quarter, the underlying strength which manifested itself in June in spite of strikes and the strong resistance to seasonal forces in July. The numerous all-time records that were broken in August were overlooked, as were the fairly definite encouraging signs for satisfactory business over the remainder of the year.

Looking back at the jittery situation that existed last Tuesday and Wednesday, one wonders if our national business structure has become more sensitive to shock than it was before the depression. Stock market authorities declare that today a relatively small selling movement will push the market down, whereas half a dozen years ago a decidedly strong selling pressure was required to force prices down.

If it is true that financial, industrial and commercial interests today are more sensitive to shock than heretofore, then it is all the more important that the machinery for stability be strengthened. The government professes to be working for stability, but many of its acts, or, in the case of the budget, failure to act, are producing the opposite effect.

The greatest conceivable force for stability today is teamwork. Let the government quit baiting and fighting industry, let labor drop its feud, and let nations quit putting chips on their shoulders. The result would be stability and, in some countries including the United States, a high degree of prosperity.



STEEL'S index of activity declined 3.6 points to 104.9 in the week ending September 4:

Week ending	1937	1936	1935	134	1933	1932	1931	1930
July 3	115.3	97.5	64.1	52.3	71.4	49.2	64.1	75.0
July 10	103.8	100.9	76.5	67.8	79.1	41.7	69.4	86.9
July 17	115.7	99.9	79.8	68.1	79.4	46.9	70.0	79.1
July 24	108.0	102.1	80.8	66.4	78.8	51.5	69.7	78.7
July 31	109.1	102.5	78.4	64.6	75.8	46.1	68.9	79.2
Aug. 7	107.3	98.7	73.4	64.6	74.7	45.1	67.0	85.6
Aug. 14	113.8	92.6	71.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	110.3	97.7	77.0	60.3	71.6	44.9	67.3	88.5
Aug. 28	108.5†	94.0	77.3	55.1	70.3	45.2	66.5	87.4
Sept. 4	104.9*	87.5	70.9	53.5	65.5	45.4	65.3	79.0

†Revised. *Preliminary.

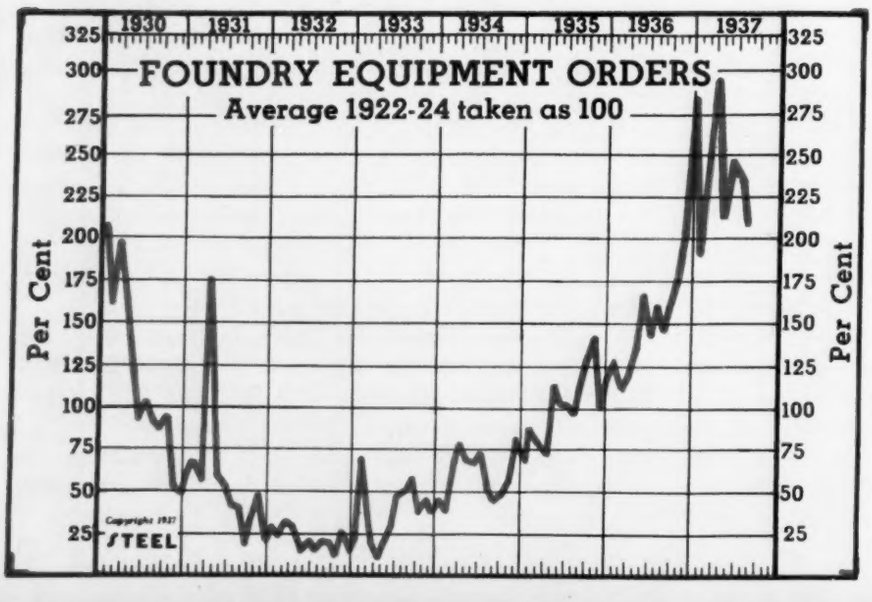
External Factors Obscure Outlook for Fall Activity

UNEASINESS which prevailed in financial circles and to a lesser extent among industrial executives in the days immediately following Labor day was based more upon fears of external complications than upon the near-at-hand domestic business situation.

Excluding the factors associated with the foreign war scares, industry's interest lies in the prospect for the early resumption of active demand. This involves the state of inventories in consumers' hands, the speed with which automobile manufacturers will be needing steel and parts for new models, the degree of success with which the railroads iron out their difficulties and similar questions.

Fundamentally, industrial activity has not suffered any unusual or unexpected setback. STEEL's index for the week ending Sept. 4 stands at 104.9, a drop of only 3.6 points from the previous week. This expected recession was caused entirely by a further drop in automobile production. Steel operations were steady, car loadings were up and power output touched a new high.

A further drop in the index will occur in the week ending Sept. 11. The rebound, as registered in the index for the week ending Sept. 18, will be significant in view of the uneasiness prevailing today in some quarters.

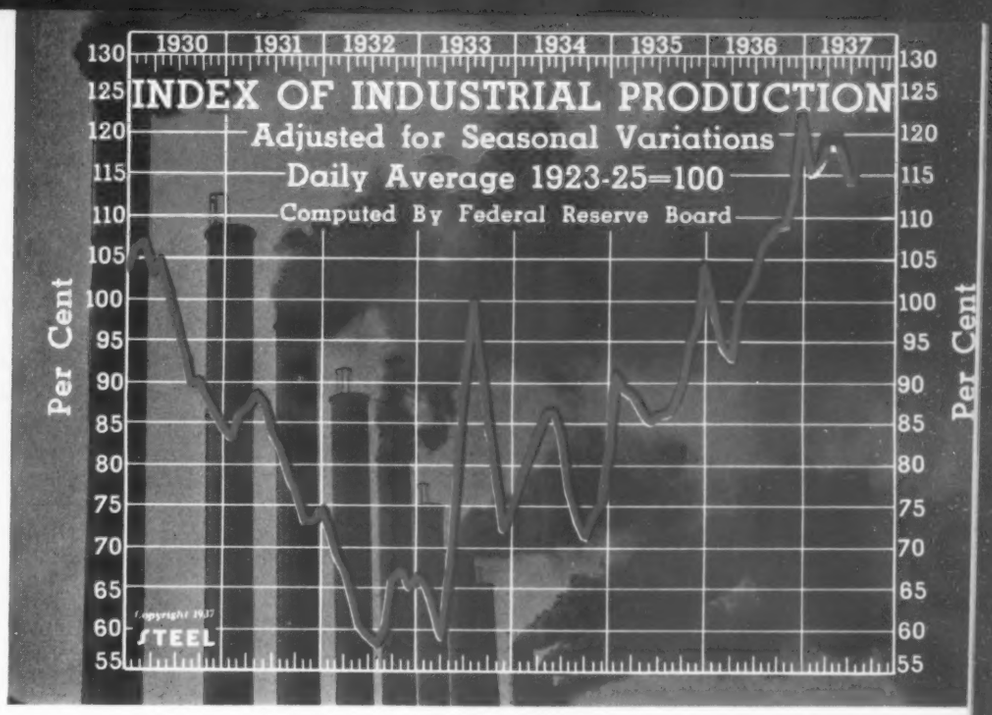


	Per Cent			
	1937	1936	1935	1934
Jan.	190.9	127.0	76.6	37.2
Feb.	249.5	110.4	75.7	65.8
March	294.2	115.0	69.4	75.4
April	208.3	134.0	113.2	67.9
May	242.0	165.4	100.7	66.5
June	228.2	141.4	100.2	70.4
July	204.0	159.6	94.0	50.7
Aug.	.....	144.8	113.0	43.1
Sept.	.....	161.0	128.5	46.4
Oct.	.....	173.8	140.0	55.3
Nov.	.....	200.4	100.4	80.4
Dec.	.....	283.3	118.1	66.9

BUSINESS TREND

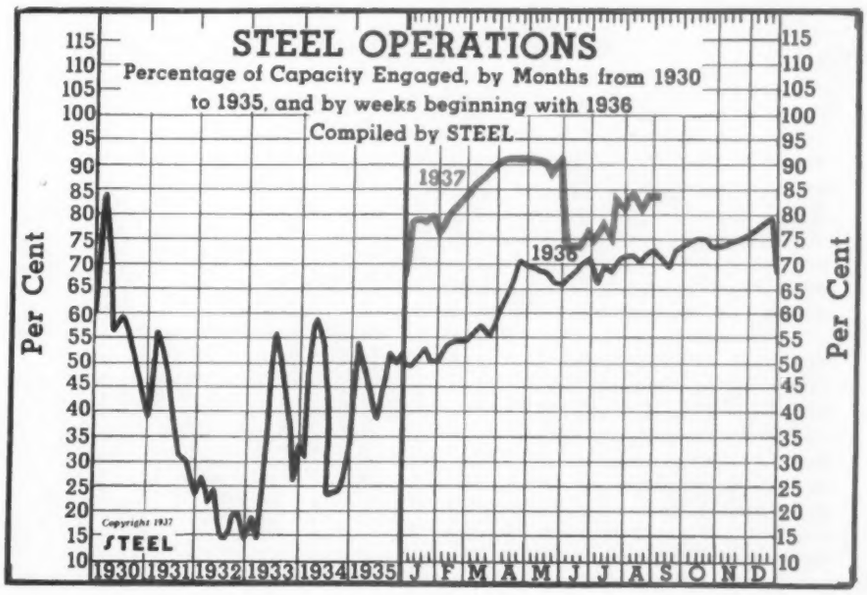
Industrial Production Index Unchanged at 114 Per Cent

January	115	98	91	78
February	116	94	89	81
March	118	93	88	84
April	118	98	91	78
May	118	101	85	86
June	114	103	91	78
July	114	107	86	75
August	...	108	87	73
September	...	109	89	71
October	...	109	95	73
November	...	114	98	74
December	...	121	104	86



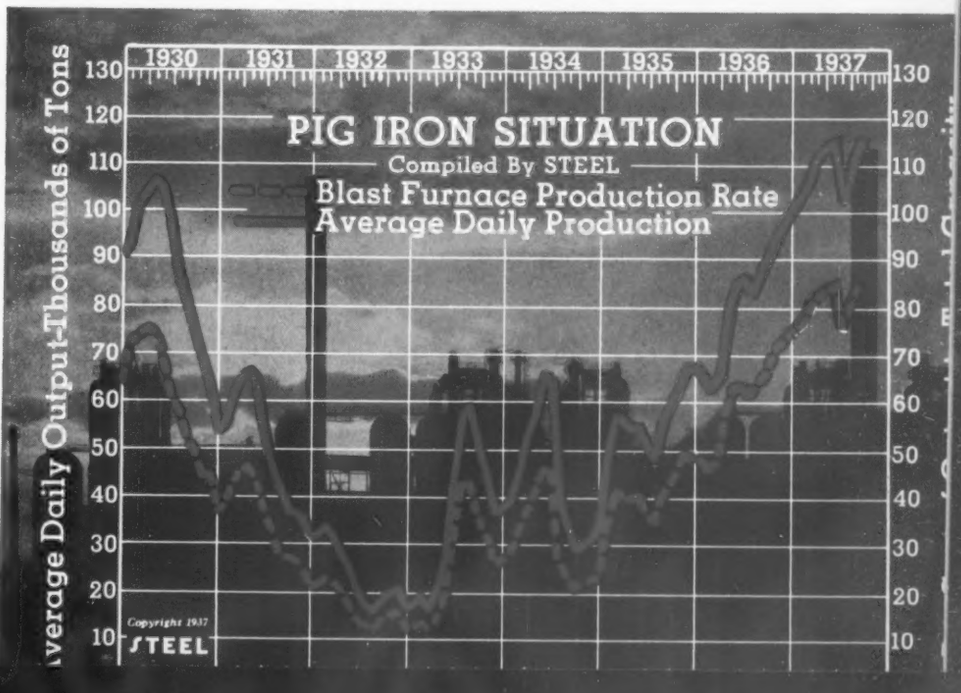
Steelworks Operations Hold At 83 Per Cent of Capacity

	Per Cent		
	1937	1936	1935
Sept. 4	83	71.5	52
Aug. 28	83	73	52.5
Aug. 21	81	72	52.5
Aug. 14	84	70.5	51.0
Aug. 7	84.5	71.5	48
July 31	84	71.5	47
July 24	81	70.5	45
July 17	82	68.5	43
July 10	74	69.5	38
July 3	77.5	66	31
June 26	74	71.5	37


STEEL OPERATIONS
Percentage of Capacity Engaged, by Months from 1930 to 1935, and by weeks beginning with 1936
Compiled by STEEL
1937
1936
Per Cent
Per Cent
Copyright 1937 STEEL
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D

Daily Output of Pig Iron Highest Since August 1929

	Daily Average, Tons		Blast Furnace Rate, Per Cent	
	1937	1936	1937	1936
Jan.	103,863	65,461	76.6	48.2
Feb.	107,857	63,411	79.5	46.6
March ...	111,951	66,004	82.5	48.5
April ..	113,354	80,316	83.7	59.1
May ...	114,360	85,795	84.3	63.1
June ...	103,843	86,551	76.6	63.6
July ...	112,947	83,735	82.9	61.5
Aug.	116,676	87,475	85.7	64.3
Sept.	.....	90,942	....	66.9
Oct.	.....	96,509	....	71.0
Nov.	.....	98,331	....	72.3
Dec.	.....	100,813	....	74.2


PIG IRON SITUATION
Compiled By STEEL
Blast Furnace Production Rate
Average Daily Production
1930 1931 1932 1933 1934 1935 1936 1937
Average Daily Output-Thousands of Tons
Copyright 1937 STEEL

New Low Alloy Steels With Unusual Properties Are Results of Research

BY R. S. A. DOUGHERTY
Manager, Development & Research Department, Bethlehem Steel Co., Bethlehem, Pa.

THE low-alloy structural steels now used in the construction of transportation equipment, to reduce weight and increase pay load, differ from the more familiar types of alloy steels, such as those of the S. A. E. series, in that they can be employed to advantage in the as-rolled condition. Such steels of which Bethlehem Steel Co.'s Mayari R* is an example, are used without heat treatment, except for the customary annealing of sheets, and their composition is selected to produce a material that will not harden appreciably in rapid cooling; this in order that thin sections and welds, or the steel adjacent to welds, may not harden and require heat treatment with its resulting reflection in cost. Although the strength of such steels is appreciably higher than of that of ordinary structural steel, it must not be excessively high, because the difficulties of fabricating become too great as the steel gets too strong and hard. An ideal material, considering both strength and ease of working, is a steel with minimum yield point of 50,000 to 55,000 pounds per square inch and minimum tensile strength of 65,000 to 75,000 pounds per square inch.

In order that full advantage may be taken of the higher strength, a low-alloy steel for most applications must also have much greater resistance to atmospheric corrosion than a plain steel. Otherwise, as equal exposure would result in equal loss in section for both steels, structures fabricated of the higher tensile variety would naturally suffer a far greater loss in strength than would the plain steel.

The composition of Mayari R steel was selected to produce a steel of the following properties:

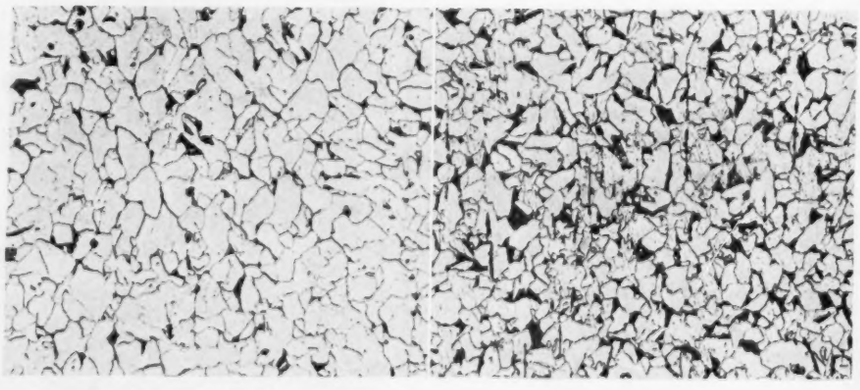
1. A strength appreciably in excess of ordinary structural steel.
2. Good hot- and cold-working properties.
3. Good welding characteristics.
4. Little tendency to harden on rapid cooling.
5. Great resistance to atmospheric corrosion.

To attain such a combination of properties it is necessary that the carbon content be held low and the increased strength be brought about by elements other than carbon. The carbon content of Mayari R has therefore been fixed at approximately 0.10 per cent, and the desired strength and corrosion resistance are obtained by addition of nickel, chromium, manganese, silicon, copper and phosphorus.

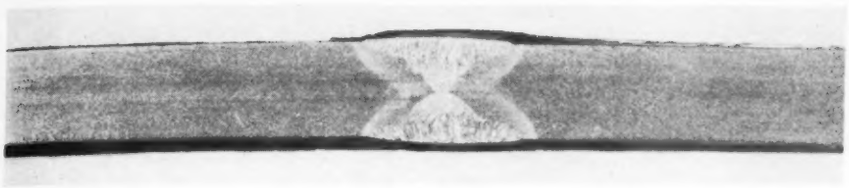
Extensive work on steels of the Mayari type has indicated that steels within the following ranges of composition, which belong to the Mayari R classification,

C	.08- .20
Mn.	.50-1.00
P	.04- .12

*Pronounced My-ree; *R* denotes rust resistance.



MICROPHOTOGRAPHS of the structure of two samples of Mayari R steel in as-rolled condition. Magnification 100X



MACROGRAPH showing weld in half-inch plate of Mayari R steel

S	.05 max.
Si	.05- .50
Cr	.20-1.00
Ni	.25- .75
Cu	.50- .70

have a minimum yield point of 50,000 pounds per square inch, a minimum tensile strength of 65,000 pounds per square inch, and meet the other requirements. In order to investigate the merits of this steel typical open hearth heats were made with a variety of products to determine the case of fabricating and the properties of the fabricated products. Observations and results of tests on two of these heats, which will be designated as Nos. 1 and 2, are given in the following. The analyses of the heats were as follows:

No.	C	Mn	P	S	Si	Ni	Cr	Cu
1	.08	.45	.099	.035	.10	.34	.25	.50
2	.08	.72	.100	.042	.40	.33	.56	.62

The composition of heat No. 1 is of this steel. It is also used for thin plates and rivets. Heat No. 2 is designed for products such as heavy plates, bars and structural members.

The steels were fully deoxidized and poured into hot-topped molds, slab ingots and mill ingots being particularly suitable for sheets, one of the most important applications cast from each heat. The slab ingots were rolled into slabs and then into plates, the mill ingots into blooms and billets for subsequent fabrication into different products. Slabbing and blooming offered no difficulties and the surface of both slabs and blooms was excellent.

Blooms of the softer steel, No. 1, were rolled into sheet bar and then into sheets of various gages. No difficulty was experienced in rolling, and the surface was good. Tensile and laboratory bend tests are given in Table I.

Sheared plates of various standard thicknesses were rolled from the two steels. The slabs were heated to the temperature usually employed for soft steel, and no difficulties were encountered in the rolling. Tensile properties, brinell hardness, and bend-test results for the plates are given in Table II.

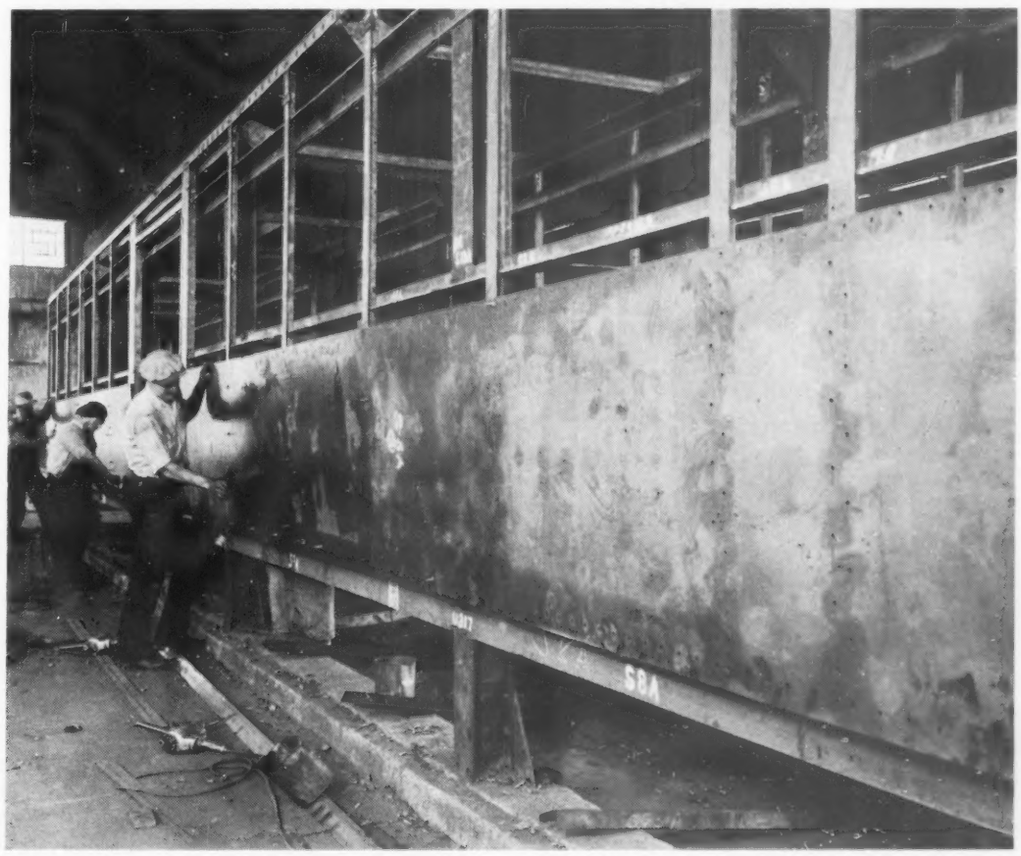
For both qualities the required minimum tensile strength and yield strength, 65,000 and 50,000 pounds

TABLE I

Tensile and Bend Tests on 16 Gage Sheets, Steel No. 1

Treatment	Direction	Yield Point Lbs./Sq. In.	Tensile Strength Lbs./Sq. In.	Elongation Per Cent 2 In.	Elongation Per Cent 8 In.	Flat Bend	Rockwell F 60 Kg. 1/16-In ball
Blue Anneal	L	55,300	68,100	30	20	OK	....
Blue Anneal	T	57,400	76,600	34	21	OK	....
Blue Anneal and P. L.	L	54,500	71,900	34	19.5	OK	100.6
Blue Anneal and P. L.	T	54,000	71,000	35	21.5	OK	....
Blue and Box	L	49,300	67,500	33	19	OK	98.8
Blue and Box	T	50,700	68,800	32	20.5	OK	....
Blue and Box and P. L.	L	53,000	65,500	30	22.5	OK	98.2
Blue and Box and P. L	T	56,300	68,800	30.5	21.5	OK	....

Blue annealed—Normalized at over 1700 deg. F.
Blue and Box—Above anneal followed by box annealing.
P. L. —Patent (stretcher) levelled.



PUTTING side panels on car for use on San Francisco-Oakland Bay bridge. Railway equipment offers one field of use for the new high - strength low - alloy steel

per square inch respectively, are exceeded in all plate thicknesses. The ductility, judging by elongation and reduction of area, is also satisfactory in every case. Steel of any gage could be bent flat upon itself.

Micrographs of the ⅜-inch and ¾-inch plates in the as-rolled condition revealed that the structure of Mayari R steel is practically indistinguishable from that of a low carbon unalloyed steel. Izod impact resistance of longitudinal specimens from ½-inch plate were as follows:

	As Rolled	Normalized
No. 1	82 ft. lbs.	81 ft. lbs.
No. 2	80 ft. lbs.	87 ft. lbs.

Impact resistances of V-notched Charpy specimens from ½ inch plate at room temperature and at 32 degrees Fahr. were also satisfactory both in as-rolled and normalized condition.

No difficulty was encountered in rolling Mayari R steel into structural members. The tensile properties of a 15-inch I-beam rolled from steel No. 2 were as follows:

Yield point	54,600 lbs. per sq. in.
Tensile strength	74,500 lbs. per sq. in.
Elongation (8 in.)	26.2 per cent
Reduction of area	57.0 per cent

The surface properties were satisfactory.

Results from double shear tests on ¾ x 2¼-inch pan head rivets gave a tensile strength of about 75,200 pounds per square inch for rivets made from steel No. 2, practically the same as high-tensile manganese rivets (75,000 pounds per square inch). For rivets made from the softer No. 1 steel the strength was about 61,000 pounds per square inch. An interesting property of Mayari R steel is the high endurance limit. Endurance tests were made in the R. R. Moore machine on specimens taken from rivet bars; the endurance limit, as determined by 10,000,000 cycles, was found to be 49,200 pounds per square inch. With a tensile strength of 75,200 pounds per square inch this gives an endurance ratio of 0.66, a very high value, typical of the low alloy steels in which the hardening is produced by elements other than carbon.

Results of air-hardening tests on ¾-inch rivet rods are given in Table III; data on a medium manganese steel have been included for comparison. The data show that Mayari R steels have little tendency to air harden, even when air cooled from 1870 degrees Fahr.

The work of planing, upsetting and forming ⅜-inch plate made from steel No. 1 to produce electrically welded pipe showed little or no difference from that of plain low carbon steel. Acceptable welds were obtainable at high speeds.

It must be kept in mind that Mayari R steel cannot be formed and drawn as drastically as a dead soft steel, but otherwise no serious difficulties are encountered in fab-

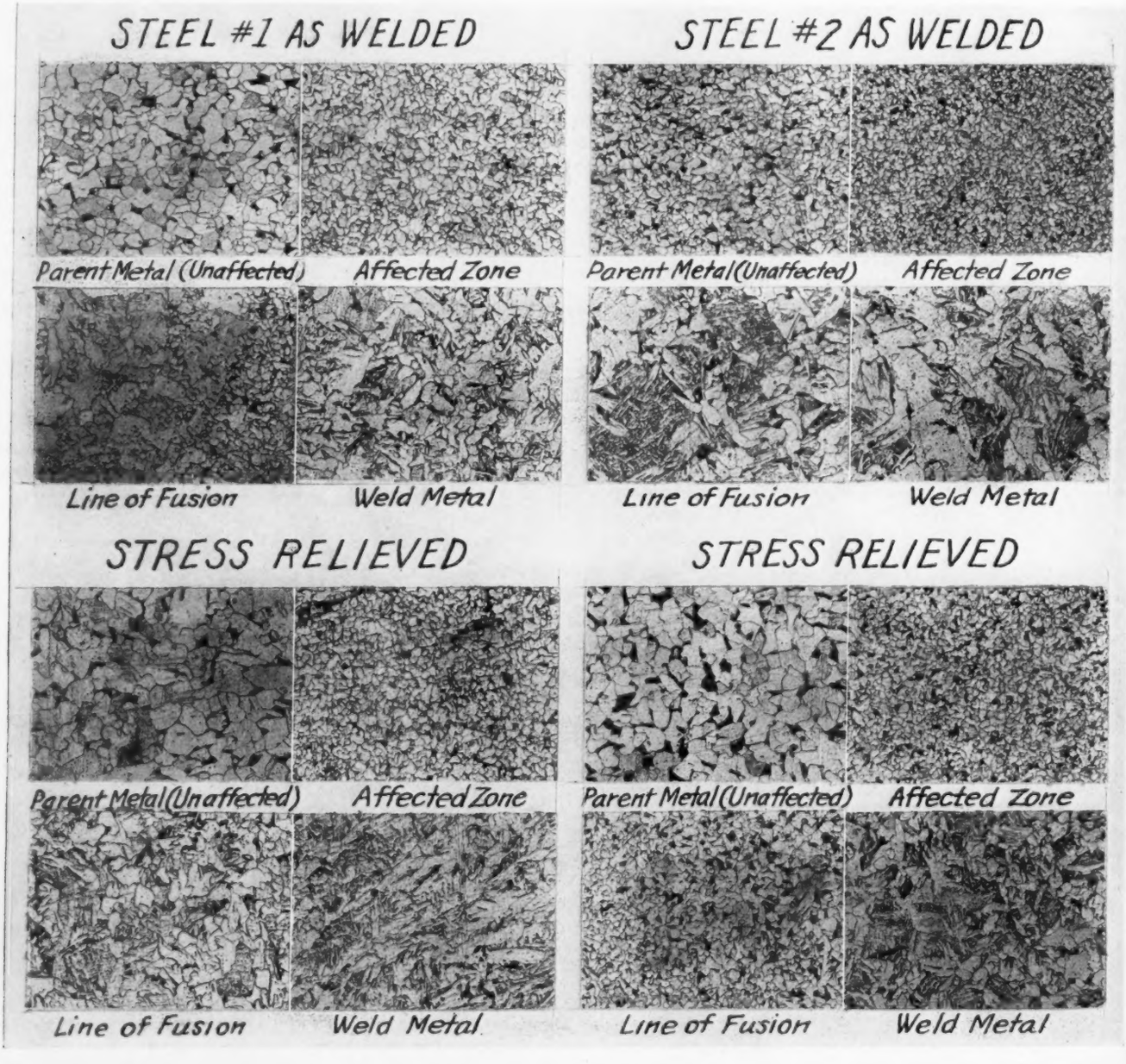


TABLE II

Physical Properties of Plates from Mayari R Steel

Thickness In.	Direction of Rolling	Yield Point Lbs./Sq. In.	Tensile Strength Lbs./Sq. In.	Elongation in 8 In. Per Cent	Red. of Area Per Cent	Brinell	Bend
Steel No. 1							
3/16	L	57,600	71,900	28.0	66.3	137	Flat
¼	L	52,350	68,600	30.0	61.4	131	Flat
Steel No. 2							
3/16	L	63,000	81,900	20.0	62.9	163	Flat
¼	L	66,200	81,900	28.0	64.7	156	Flat
⅝	L	58,200	78,400	28.0	57.4	156	Flat
⅜	L	54,900	78,400	25.5	60.6	152	Flat
½	L	54,900	78,400	25.5	60.6	152	Flat
¾	L	50,000	75,200	30.0	52.1	167	Flat

rication. It can be worked hot and cold, and welds satisfactorily without air hardening.

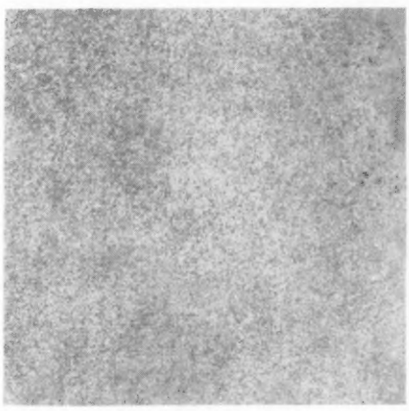
Corrosion resistance is an important consideration in connection with a high tensile steel. Obviously, a reduction in section as made permissible by the higher yield point would be of no advantage if the resistance to corrosion did not increase correspondingly. Otherwise the thin sections would scale off or pit through much faster than the thicker section of unalloyed steel.

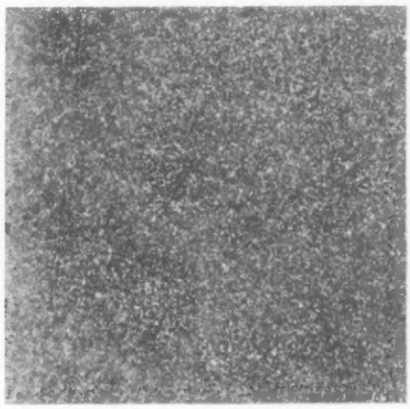
Atmospheric exposure tests of several years duration made in industrial atmospheres at widely separated localities have all shown that the corrosion resistance of Mayari R steel varies somewhat in the different localities; this makes it impossible to say the latter steel is exactly "X" times as corrosion resistant as ordinary steel. All tests, however, definitely show that the corrosion resistance of Mayari R steel is far superior to that of even copper-bearing steel. In services where the life of copper-bearing steel would be twice that of ordinary steel it seems a conservative assumption that the life of Mayari R steel would be fully two or three times that of copper-bearing steel or six times that of plain steel.

Mayari R steel can be readily welded by any of the well-known processes, such as the electrical resistance method and by all of the fusion methods. However, like plain carbon steels, consideration should always be given to the preferred welding procedure which depends upon materials, designs, and the qualities desired in the welded joint for a particular service.

Under resistance welding the test results of spot welding, seam welding and flash butt welding were very satisfactory; compared to soft auto body sheets the shear tests were proportionally higher, while the single spot twisting test naturally was lower. The test results indicate that Mayari R steels are entirely suitable for all types of electrical resistance welding.

A comprehensive program was also carried out with Mayari R steels to determine the effect upon the weldability of conditions such as the temperature of the parent metal, (from 10 to 400 degrees Fahr.), thickness of section, hardenability, and stress relieving subsequent to welding. Rockwell hardness figures for parent metal, weld, line of fusion, and affected zone are given in Fig. 5. Results obtained in welding at 5 to 15 degrees Fahr. without subsequent heat treatment, were practically identical with those shown in Fig. 5.





MAYARI R steel (left) and ordinary steel (right) after more than two years' exposure to atmosphere. Tests indicate this new steel will last several times as long as ordinary steel

Some of the important precautions in the welding of carbon steels also apply to Mayari R steel and are given here to emphasize the vital need for procedure control in fusion welding to obtain maximum benefits of Mayari R steels in their various applications.

(A) When welding heavy sections preheating assists in reducing distortion.

(B) Assemblies must be carefully planned to permit free movement of parts in shrinkage or welded sections.

(C) Structures must be stress relieved after welding when fatigue or dynamic stresses are present.

TABLE III

Hardening Tests on ¾-Inch Rounds of Mayari R Steel

Material	Treatment	Yield Point Lbs./Sq. In	Tensile Strength Lbs./Sq. In.	Elongation in 8 In. Per Cent	Reduction of Area Per Cent	Increase in Tensile Strength Per Cent
Steel No. 1	A	45,200	61,600	32.8	74.4	0
Steel No. 1	B	46,100	62,800	32.2	72.9	1.9
Steel No. 1	C	47,000	63,700	31.4	71.4	3.4
Steel No. 1	D	46,100	63,700	30.2	70.0	3.4
Steel No. 1	E	45,500	62,200	29.6	71.3	1.0
Steel No. 2	A	55,300	73,400	29.7	71.0	0
Steel No. 2	B	46,300	74,000	30.0	73.7	0.8
Steel No. 2	C	47,600	74,650	29.7	73.7	1.7
Steel No. 2	D	55,800	74,000	28.7	72.9	0.8
Steel No. 2	E	49,300	75,000	28.2	74.0	2.2
Medium Manganese Steel	A	55,800	90,000	26.5	67.0	0
0.33 C	B	66,700	98,500	20.0	68.2	9.4
1.68 Mn	C	69,400	98,600	21.4	68.0	9.6
0.025 P	D	76,200	107,250	14.0	47.4	19.2
0.029 S	E	53.600	91,300	23.0	67.0	1.5
0.21 Si						

A—Furnace cooled from 1385 deg. F.
B—Air cooled from 1385 deg.
C—Air cooled from 1560 deg.
D—Air cooled from 1870 deg.
E—Air cooled from 1870 deg., reheated to 1480 deg., and cooled in furnace; reheated to 1120 deg. and cooled in air.

Dual Speed Automotive Axles Provide New Use for Zinc Alloy Die Castings

POWER when you need power, but "relaxed" motor and transmission operation while cruising along over favorable road, is the fashion in automotive engineering today. Various manufacturers dub the new equipment "dual ratio," "overdrive," or "two-speed axle"—but all of it does substantially the same job, i.e. it permits a reduced engine and in some cases transmission speed for a given rate of travel when the alternate gearing is "thrown in." Some of the units "throw in" automatically when the accelerator is flipped at car speeds over a set figure; some carry manual dash controls which permit either high or low gear-ratios at any speed. In some cases "over-drive" is standard equipment, in others it is elective at slight extra cost on new or old cars. In any event it saves gas and oil, reduces wear and tear on engines, and abates car noise and vibration.

That's "overdrive" to the user. But what is "overdrive" to the metal man and designer? Largely it is more steel gearing plus actuating and control mechanisms, which may be produced easier and less expensively in other materials.

In the case of the two-speed axle built by Columbia Axle Co., Cleveland, which effects the "overdrive" feature between the rear axle ring gear and the differential, practically all of the actuating and control mechanism is in zinc alloy die castings to obviate machining and assembly worries and reduce numbers of parts. All the parts shown in the accompanying photos are of zinc alloy and comprise: the carburetor adapter for tapping the intake vacuum to actuate sundry valves and pistons, the actuating valve mechanism itself which mounts under the hood, and the combined vacuum-cylinder-base and shifter-shaft-housing which attaches to the two-speed axle housing. Other die cast zinc alloy parts on various Columbia two-speed axle models are the synchro hub, a strictly functional part, and the dash escutcheon and handle, truly hardware, which are shown in the auxiliary photo.

An interesting thought is that, at first, Columbia used a bronze actuating valve mechanism which required considerable machining. As production increased with public acceptance of overdrive, production dollars could be saved by switching to die castings. Even so, two zinc parts preceded the present one-piece valve body carrying four copper tube inserts.

Far from new are zinc alloy parts on automobiles. Carburetors, grilles, horns, hardware, and many other parts have long been die cast. But now Columbia's two-speed axle introduces new zinc items into today's automobiles and points again to the trend towards using more and more such parts for functional, load-taking, dynamic applications as over and against the older and more established uses of the metal and method of manufacture for strictly static, housing, and ornamental pieces.

OVERDRIVE adds more zinc alloy die castings to the modern automobile. Those here shown are used in Columbia's two-speed axle system

Makes New Soldering Flux

A new stainless steel soldering flux, claimed to be revolutionary in its results and action on the metal, has been announced by Glen C. Baker of the Ruby Chemical Co., Columbus, O. The new flux was perfected by Baker after several years of laboratory tests and actual use in industrial plants. Available in pints, quarts and gallons, outstanding features are said to be that no special solder or soldering equipment is required, that the flux does not give off strong, offensive odors and that it will not burn severely when in contact with the hands.

Nibbling As an Aid to Fabrication

The rapid rise of welding as a means of metal products fabrication, and also as a means of quick and effective repair, has necessarily put a considerably different face upon the entire metal fabrication field. Methods that tie in properly with welding are always welcome in the shop.

An interesting fabrication sidelight that is often highly valuable is the proposition of passing one member through another, and especially the passing of structural shapes, pipes, and others through sheet material members. When and where this is done, it offers opportunity to weld the two members together in a manner making for the greatest amount of rigidity possible.

In this connection, the nibbling machine holds forth remarkably, since it offers a splendid means of cutting any desired shape and size of hole at any location in almost any type of sheet material. Metal as thick as ⅜-inch can be nibbled to very good advantage in this way.

Doubtless this is a method that will be relied upon to an extent sufficiently great to bring it forcibly to the attention of metal products designers in the future. Further than this, it is to be expected that the maintenance man will also take note of the various possibilities such a process offers for building and repairing various types of plant equipment and furniture.

New Plastic Refractory For Ladle Linings

Ironton Nojoint is a plastic refractory recently introduced by Ironton Fire Brick Co., Ironton, O. It enables the foundry operator to get monolithic ladle linings which are much more resistant to the corrosive action of soda slags than ordinary ladle brick and which do not cut out. The material is made from a special type of fire clay grog and has been found successful for lining large ladles in which Purite is used to refine the metal.

"Ranger"

SAILS TO VICTORY

WITH

VANADIUM

STEEL RIGGING

When the Cup defender lost her mast in a trial sailing, Chromium-Vanadium Steel was selected for the fixed rigging. Horace T. Potts Co., Philadelphia, and Brown-Wales Co., Boston, supplied the ELASTUF TYPE. A Chromium-Vanadium Preheat Treated Steel and fabricators completed within twenty days a manufacturing job that would ordinarily have required twelve weeks. Photo: Courtesy of E. F. Houghton & Co.

Maximum strength with minimum weight... ability to absorb stresses and strains as 6,000 feet of mainsail billow with the breeze... absolute dependability — these were the specifications for the steel to be used in the stays and rigging of America's Cup defender.

Chromium-Vanadium Steel met all these requirements—as it is meeting thousands of severe specifications throughout industry — and the "Ranger" successfully defended the Cup with stays and rigging of Chromium-Vanadium Steel.

Are you looking for greater strength in a steel part? Would you like to reduce weight in a forging or casting? Have you a steel part that is giving trouble in service? Metallurgists of the Vanadium Corporation of America will be glad to help you.

•

VANADIUM CORPORATION OF AMERICA
420 LEXINGTON AVENUE, NEW YORK, N. Y.

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.

Vanadium Steels

Booth NO H-20
NATIONAL METAL EXPOSITION

METALS VANCORAM ALLOYS

FERRO ALLOYS
of vanadium, silicon, chromium, and titanium, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

FOR STRENGTH · TOUGHNESS · DURABILITY

Major Pipe Line Is Constructed by The "Stove-Pipe" Jointing Method

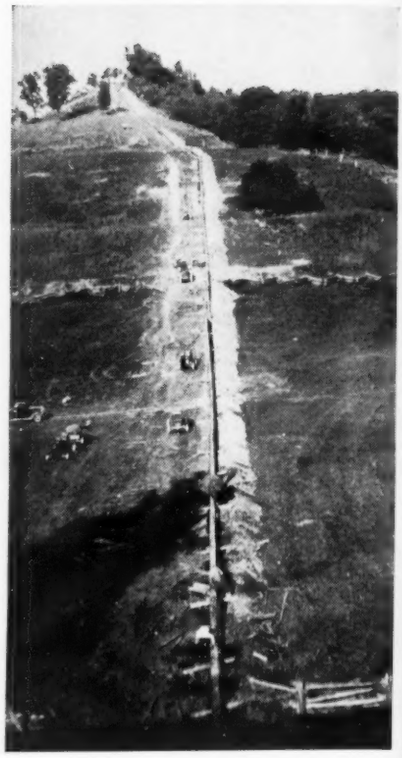
HOPE NATURAL GAS CO. has completed its 94-mile 12¾-inch pipe line from Hastings to Clendennin, W. Va. This line was built to carry up to 1500 pounds pressure and seamless pipe with ⅜-inch wall was used. The line was laid through the heart of the West Virginia mountains and the right of way was extremely rough, and so inaccessible that only 20-foot pipe was ordered. Electric welding was specified for the field joints, an innovation being the use of the so-called "stove-pipe" method of pipe line construction. Under this method each joint is handled individually and welded onto the line one joint at a time.

Under the usual method of pipe line construction the joints of pipe are lined up on skids and dollies and roll welded ahead of the ditch into long sections approximately 200 feet long. These long sections are then placed over or in the ditch and tied in with bell hole or position welds. Pipe then is lowered into the ditch. Under the stove-pipe method each weld is a position weld. The lining up of the pipe in long sections and the roll welding is eliminated. Because of the extremely rough country and the difficulty in transporting equipment, only a limited amount of pipe could be laid per day by either method. It was found that by the addition of a couple of welding machines, at the same time eliminating the line up crews and their tractors, the required number of welds could be made each day even though all of them were position welds.

Although the stove-pipe method had previously been used on short and small diameter lines, this is the first time it had been used on a major pipe line of this size. The right of way was cleared, pipe strung and the ditch dug ahead of the bending operations. Bending of the pipe was also performed ahead of the stabbing and welding crews. All bends were made by fire on single joints. Hand winches and hand labor were used. Each joint was lined up on skids across the ditch and as a subsequent joint was laid over the skids, two welders, one working on each side of the pipe, immediately tacked same and applied the first bead completely around the pipe. The time for tacking and making the first bead varied from 1¼ to 1½ minutes of actual welding. The tacked pipe was then left on the skids behind the pipe crew. Following the pipe crew came the main welding gang comprised of 8 to 10 welders. These welders completed each weld by adding three additional beads around the pipe while it was on the skids.

Pipe then was ready for lowering into the ditch. At road crossings and other pipe line crossings or obstructions, a skip was usually left by the pipe crew so as not to hold up its daily progress. These skips were welded in by a small crew and one welder coming behind. After the line was finally completed, a final test was made under gas pressure of 1200 pounds. In the entire 94 miles only one leak was found. Construction on the work started Aug. 13, 1936, and was completed Nov. 27, 1936. Three gangs were used with two tackers, 9 or 10 welders and one final tie-in welder in each gang. There was a total of 24,765 welds in the line. Despite the fact that heavy pipe was used and much time was lost in moving the equipment, and that bad weather often was a handicap, the welders averaged 1.46 tie-in welds per hour. The maximum day's run of one gang was 180 welds with nine welders.

The machines of the main line welders were moved by two tractors on each gang. The tacking machines were also moved by tractors. With the exception of a few strips of fairly level country, all of the stringing, ditching and handling of the pipe was done by hand. The contour of the country was so precipitous that machines and tractors for handling the pipe could be used only occasionally. Ligon & Ligon, Baltimore, were the contractors on the ditching, bending, pipe laying and back filling. H. C. Price Co., Bartlesville Okla., was the welding contractor.



Electric welding, using stove-pipe method, was employed in constructing 12¾-inch, 94-mile pipe line in mountainous country in West Virgina

Each joint was lined up on skids across the ditch and as a subsequent joint was laid over the skids two welders, one on each side of the pipe, tacked the joint and applied the first bead completely around the pipe

MATERIALS HANDLING

Special Handling Facilities Used In Steel Furniture Manufacture

TWIN freight sidings and twin truck docks serve the plant of the General Fireproofing Co., Youngstown, O., to transport the volume of steel furniture and office equipment produced. Raw materials are brought into a central depot between the north and south wings of the establishment, and flow through the various fabricating and finishing processes in opposite directions to emerge finished products, crated for shipment, on the railroad or truck docks at either end of the plant which is nearly a half mile in length.

Handling the metal furniture is complicated by several factors. The products are bulky and in many cases, because of their form, cannot be stacked readily. To make the problem more difficult, the costly grained finish put on many of the finer pieces must be protected through the assembly and packing operations.

From the central depot where steel sheets and other raw materials are checked in, lift trucks and

STEEL desks are assembled upside down on a belt conveyor, as shown above. Legs and pedestals are joined to a top to form a chassis, which then is placed on its feet by a flop-over device so that drawers, reference shelves, pulls and locks can be added. Electric spot welding is used extensively in fabricating steel office equipment. In the illustration at the right, the operator is welding together parts of a desk drawer

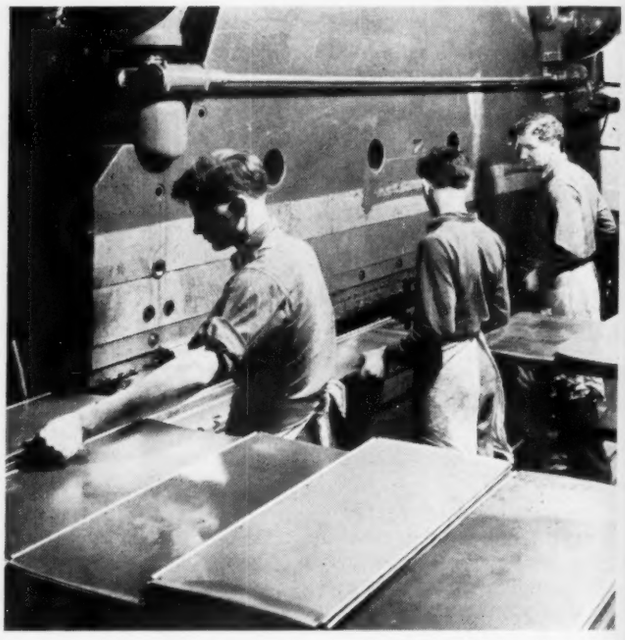
MATERIALS HANDLING

skids handle materials through the heavier fabrication operations such as rolling, stamping and shearing, in two departments which in turn feed five main divisions—steel furniture, shelving, aluminum furniture, vertical steel files and special contract work. Caster trucks are used for carrying stampings through the lighter operations, such as spot welding. After forming and fabrication operations are completed in the steel furniture division, the various parts are placed on overhead chain conveyors, which carry them through steam and chemical cleaning and degreasing units.

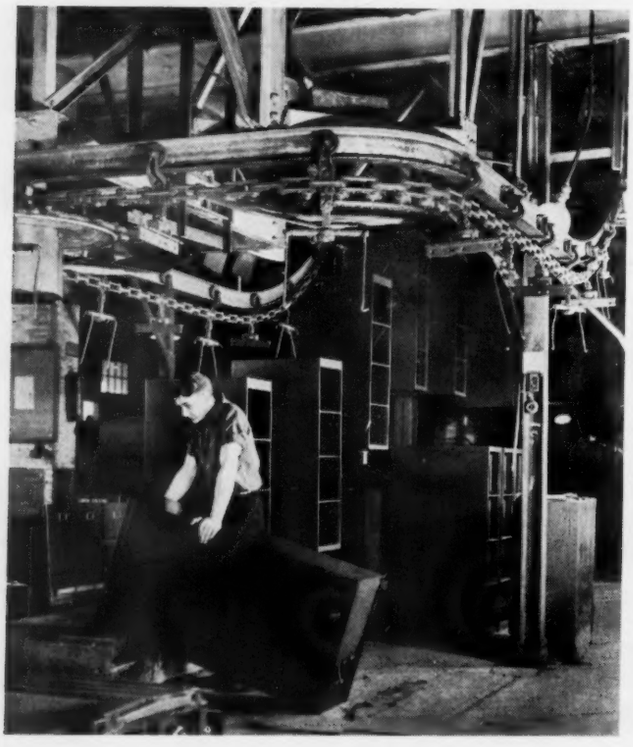
Internal Parts Dipped

Finishing operations are completely mechanized. In the enameling operation, internal parts are hooked on conveyors and passed through a dip tank. A certain definite period must be allotted for baking the enamel, and the conveyor is so regulated that the pieces remain in the oven the required period, thus insuring a perfect finish. The baking ovens are located above the roof of the single-story building housing the steel desk division, thus eliminating need for removing the heat from the building and lowering the fire hazard. Conveyors start at floor level, drop the pieces through the dip tanks, carry them up and through the ovens, and down again to floor level on the opposite end where they are put on the final assembly line.

Identical with this is the setup for the external pieces, except that spray booths are inserted in the line to replace the dip tank. All exterior pieces are inspected for finish as they come down from the baking ovens. Final assembly line begins at the end of the finishing conveyor. An interesting feature of the desk assembly line is the "flop-over" device. Assembly of desks begins with the top, which is placed upside down on the belt conveyor. Work progresses on the desks until they are ready for the drawers and hardware. At this point in the conveyor a mechanical device picks up the desks and "flops" them over right side up for the final assembly operations.



PARTS for steel shelving are shaped on large forming presses. Two to six operators man a press, depending upon the size of the work



TRAVELING more than a quarter mile on a chain conveyor, steel filing cabinet cases pass through several enamel spray booths and oil-heated baking ovens. Reaching the point shown in the illustration, the cabinets are removed and placed on an assembly conveyor where suspensions, drawers and locks are installed

Finish Is Protected

Removed from the end of the assembly line, the desks are crated for shipping or sent to the storage room where they are stacked three high by a special crane and sling, designed so that the finish will not be marred in handling.

In the division devoted to the manufacture of vertical steel files, several innovations have been used to speed up the operations. Stamping and forming operations are performed in the press room on the ground level; subassembly lines spot weld together the integral parts which are then taken up to the third floor for finishing and assembly.

First in the line of operations

(Please turn to Page 82)

JEFFREY CHAINS IN THE STEEL MILL

DRAW BENCH CHAIN

A TUG-OF-WAR IN STEEL! . . . . . .

You see it going on hourly and yearly on the draw bench, this battle between chain and bars . . . with *chain invariably the victor* when it is Jeffrey-made.

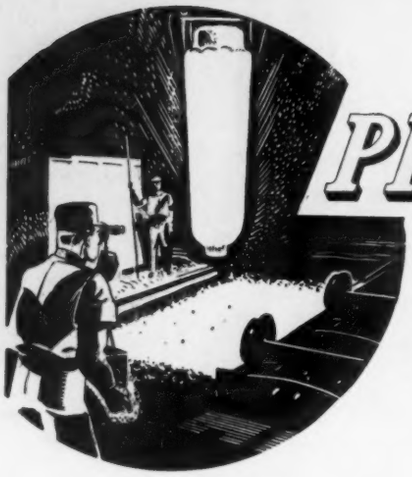
The superiority in the tug against tough cold steel reflects the stamina imparted by thorough methods, the care and scientific heat treatment employed in building Jeffrey chains for draw bench and other steel mill service.

Many new precision machine tools have been added to our chain plant. Our heat treating department has been re-equipped with the finest control instruments. All this has been done to assure you of improved results in life and service from Jeffrey chains. It is, too, a continuance of a 50-year tradition of conscientious manufacture.

You will like the champion quality of Jeffrey chains.

Also chains for Sheet Piling . . Hot Slab Transfer . . Crop Conveying . . Feeder and Catcher Tables . . Pack and Pair Furnaces . . Normalizing Furnaces

THE JEFFREY MANUFACTURING COMPANY
589-99 North Fourth Street • Columbus, Ohio



PROGRESS IN STEELMAKING

How Drag Generators Function in Holding Tension in Strip Mills

BY R. S. SAGE
Industrial Department,
General Electric Co.,
Schenectady, N. Y.

IN COLD strip rolling practice during the past few years the term "drag generator" has been coined to designate the electric drive applied to the entry reels of the mills rolling the thinner gages of steel strip. These machines are also variously referred to as "feed reel motors", "feed reel generators" and "regenerators".

The function of the drag generator, both during starting and after the mill has reached the rolling speed for which it is adjusted, is to provide a means of holding tension in the strip between the feed reel and the mill rolls. It therefore serves as a dynamic brake and as such largely has replaced friction brakes previously used on entry reels in an endeavor to maintain the strip under tension as it is pulled off of the reel by the mill rolls.

In view of its great adaptability and flexibility, it is not surprising that the electric motor should be selected for this application, when the inadequacy of the mechanical drag for the more exacting requirements of modern rolling practice became evident. High strip tensions and simultaneously high speeds meant high braking powers, for which friction brakes, besides being difficult of construction and practically impossible of regulating in accordance with the demands, were prohibitive from the standpoint of power wastage. Except for its relatively small internal losses the electric brake, that is, the drag generator, returns all of the power it develops to the system to assist the main generator to drive the various motors.

Two Units Necessary

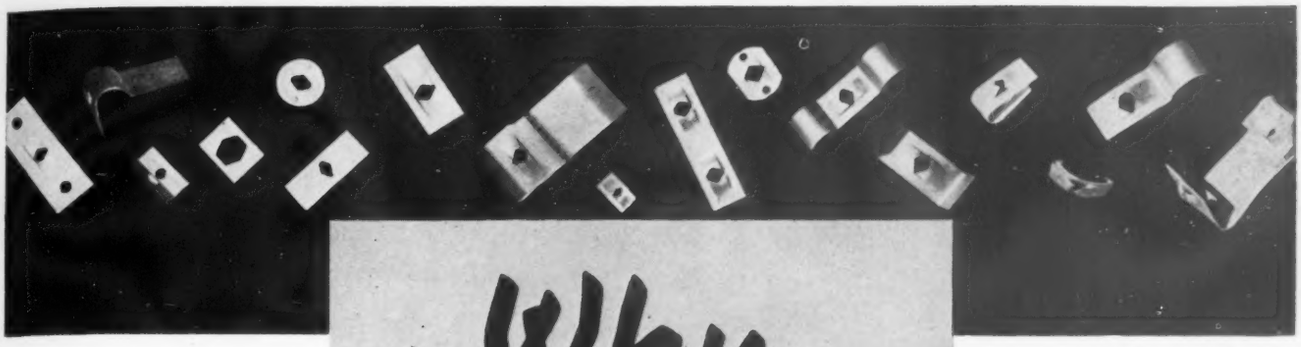
From a beginning with drives of only 5 to 6-kilowatt capacity, experience in the space of 2 or 3 short years has indicated the use of drag generators of larger and larger capacity until units of 40, 50 and even 75 kilowatt are now in demand, and each reel usually requires two such machines. Experience has fast changed the technique of thin gage strip rolling for temper, skin and finish passing, and to the high strip tensions used today, and especially to the ability to accurately control this tension, definitely are attributed finer products and better rolling conditions, and the drag generator supplies the effective and efficient means to these ends.

The drag generator is almost invariably a direct current, adjustable speed machine incorporating in the same structure the necessary gear speed reducer for obtaining the relatively low speeds suitable for direct drive of the reels. In the larger and more recent forms, the two cone type halves of the reels are mounted directly on the low speed shaft extensions of the gears. In other cases intermediate gears have been used to advantage, as dictated by circumstances. In the usual arrangement, typically for temper pass and skin pass mills, the motors driving the three principal machines, the entry reel, mill rolls, and delivery reel, are all operated from a single generator by adjustable voltage control. The prin-

Ratings of Gear Generators with Built-In Gears, from 15 to 50 Kilowatts Capacity in Speed Range of 4 to 1 for Cold Strip Mills

Generator Speed in Revolutions Per Minute	Low Speed, Revolutions Per Minute at Minimum Generator Revolutions Per Minute* Gear Ratio												
	4.2	4.55	5	5.57	6.33	7.4	9	16.4	17.6	19.1	21	22.8	25.3	28
450/1800	107	99	90	79.5	71	61	50	27.4	25.5	23.5	21.4	19.8	17.8	16
400/1600	95.5	88	80	72	63	54	45	24.4	23.7	21	19	17.6	15.8	14
300/1200	71	66	60	54	47	40	33	18.3	17	15.8	14.3	13	12	10.7

*The speed of the low speed shaft at maximum generator speed is four times these values.



Why "Speed" Nuts?

We call them "SPEED NUTS" because they can speed up your assembly line and knock the props from under your present assembly cost

SPEED is essential . . . but no more so than EFFICIENCY. The permanent holding of any SPEED NUT assembly under spring tension will add greatly to the EFFICIENCY of your product.

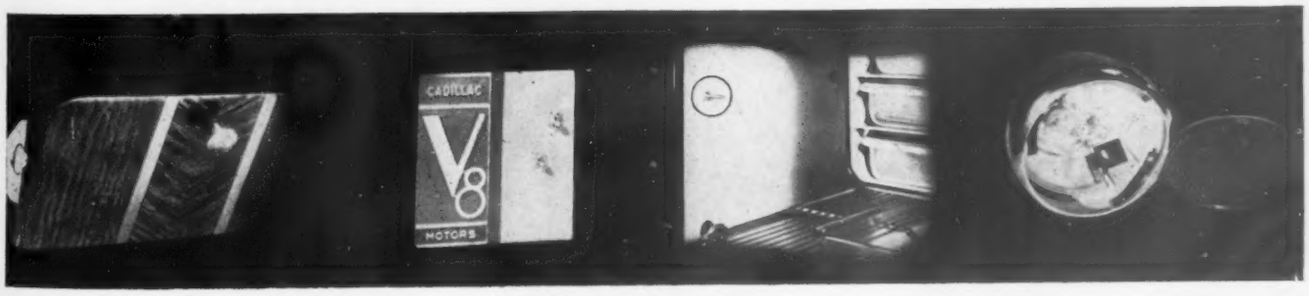
Speed Nuts PATENTED

The time saved in handling just one piece . . . a SPEED NUT . . . instead of two pieces . . . a nut and lock washer . . . will reduce your cost.

Also, SPEED NUTS can be designed to your requirements to take the place of three pieces, a stamping, a nut, and a lock washer and in many instances even a greater number of pieces can be combined into one special SPEED NUT.

Our Experimental Development Department will welcome an opportunity to work out your assembly problems. Send them to us and ask for a card of assorted samples.

SPEED NUT DIVISION
TINNERMAN STOVE & RANGE CO. • CLEVELAND, O.



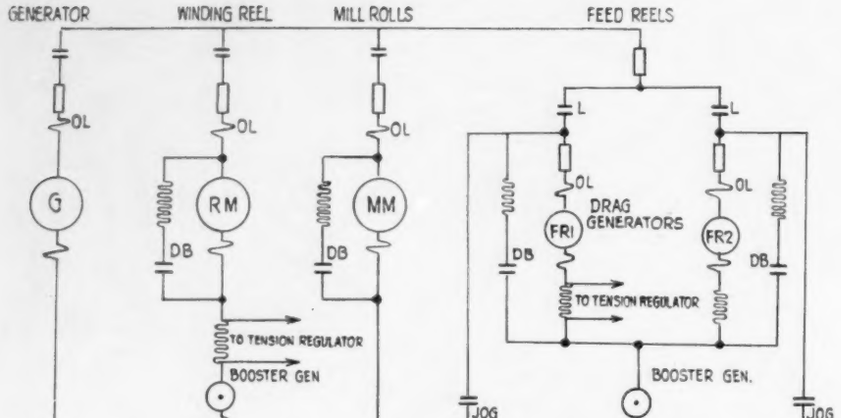


FIG. 1—Simplified armature circuit connection diagram for a typical temper pass mill, with variable voltage generator supplying motors driving feed reels, mill rolls and winding reel

cipal connections for such a simple layout are shown in Fig. 1. In order to simplify this diagram and because they have no real bearing on the subject, neither entry nor delivery pullers are shown here, although most modern mills include such equipment.

Same Voltage Conditions

The drag generator, therefore, is subjected to the same armature voltage conditions as are the mill and the delivery reel motors, but it is so connected that it tends to drive the reel against its normal direction of rotation, that is, away from the mill rolls. It therefore resists the pull of the strip and so places it under a tension, the value of which, for a given strip speed, is proportional to the armature current permitted to flow. Since at a fixed strip speed the voltage applied to the drag generator is held constant, as is that of the mill motor, the power input, product of volts and amperes, is constant and corresponds to constant tension in the strip. The truth of this is evident, when it is considered that the work done on the strip is measured by the product of the pull of the strip in pounds, tension, and its speed in feet per minute. It is thus seen that there is afforded a simple means for measuring and controlling this tension.

It should be noted, however, that as a roll of strip is unwound, the diameter of the coil decreases and the speed of the reel and drag generator must increase proportionally. Likewise, the torque developed by the drag must change inversely as the speed changes. This action of the generator is accomplished automatically by a regulator which, being set to hold the current through the armature at a constant value, continuously reduces the field current as required to increase the speed as the coil unbuilds. In so doing, the motor torque is likewise reduced and the required conditions are fulfilled, since the generator torque is proportional to the armature current, held constant, and the field strength.

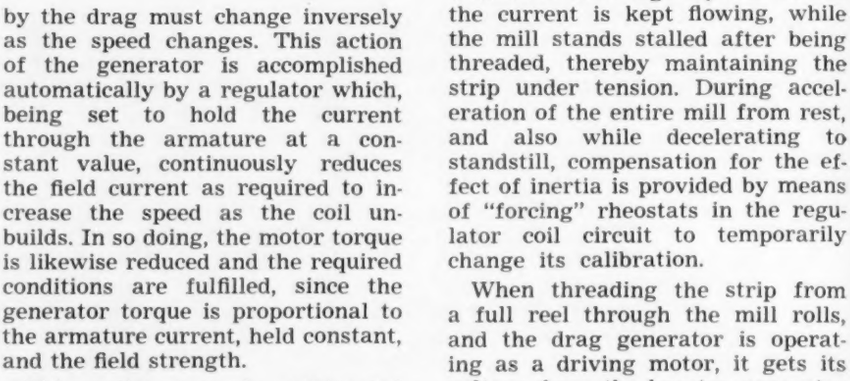
This action may be contrasted with that of a mechanical drag which in no practicable form has been able to achieve this result. Even in its most highly developed form, in which it is arranged to hold constant torque at its drum surface, it succeeds in holding the tension in the strip only in proportion to the coil diameters, full to empty, which in the average case means in the ratio of 2 to 1. Thus at the start of the unwinding the tension in the strip would be twice that at the finish. The superiority of the electric system is in striking contrast, as it is able to maintain the tension in the strip within a few per cent, even for coils which have an outside diameter three times the inside diameter.

Operates as Motor

It also is to be noted that with the mechanical brake no means is provided for rotating the coil of strip when threading it into the mill rolls at the beginning of a run, whereas the drag generator inherently has the ability to operate as a motor and may be used for this purpose. The electric system utilizes a "booster" generator in series with the drag generators, to supply a voltage equal to the resistance drop through the armature circuits of the drags. By this means the current is kept flowing, while the mill stands stalled after being threaded, thereby maintaining the strip under tension. During acceleration of the entire mill from rest, and also while decelerating to standstill, compensation for the effect of inertia is provided by means of "forcing" rheostats in the regulator coil circuit to temporarily change its calibration.

When threading the strip from a full reel through the mill rolls, and the drag generator is operating as a driving motor, it gets its voltage from the booster generator whose polarity is reversed in order to rotate or jog the reel slowly to-

FIG. 2—Simplified armature circuit connection diagram for a typical temper pass mill, with main and auxiliary generators supplying motors driving mill, feed reels and winding reel. This arrangement is for a wide speed range of reel motors



ward the mill. During this motoring action the drags are disconnected from the main generator bus, by opening the positive line contactors "L" and connected to the booster by closing the contactors "JOG", as illustrated in Fig. 1.

The speed range through which the drag generator must operate must correspond to the coil "build-up", that is, the ratio of its diameter "full" to diameter "empty" and, in addition, it must cover any range in strip speed and also margin for draft. Coil "build-up" usually ranges from 1.5 to 1 to as high as nearly 3 to 1. In order to secure good regulator operation, margins of about 10 per cent must be provided at both ends of the range. Thus with strip speed ranges of 2 to 1, the total range may be 4 to 1 or higher. Except in the smaller capacities, it has been found difficult to get stable operation with good commutation on drag generators at higher than 4 to 1 speed range and for this reason it is common commercial practice to limit the range to this value in most cases. Higher ranges, of course, can be built but are considered a special condition and avoided whenever possible.

Use Separate Generator

Therefore, if the total range, combined strip speed and "build-up" are too great for an economical and satisfactory drag generator with field control entirely, the lower speeds must be obtained by using a separate generator for the reels, entry and delivery, as illustrated in the diagram of connections, Fig. 2, or by a booster generator in series with the drags. In the latter case, the booster previously mentioned is merely designed for somewhat higher voltage and for low strip speeds it reduces the main generator voltage before it is applied to the drags.

As previously stated, it is customary to build the reduction gear integral with the generator, usually in the manner of the straight line drive so-called "gearmotor". The feed reels with which these drags are used consist of a pair of cone flanges one of each being mounted on the low speed shaft extension of the gear of a drag generator. The coil is clamped between the two cones, one or both being movable sidewise by means of a motor driven mechanism. This method of drive imposes a heavy axial thrust on the drive gears, the low-speed shafts of which accordingly are provided with heavy duty thrust bearings. Where part of or all of the gearing is built external to the generator unit the latter may need no thrust bearing, or one of reduced capacity may suffice, depending upon the design of external gear used.

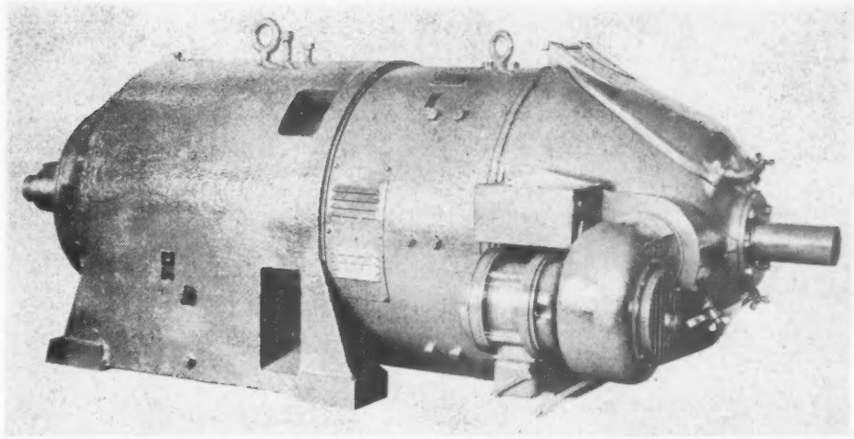


FIG. 3—General Electric drag generator for feed reel, rated at 25 kilowatts and 450 to 1800 revolutions per minute, having gear ratio of 21 to 1, with induction motor driven blower on front end-shield for forced ventilation. Gear has thrust bearing with capacity for 100,000 pounds axial thrust

The traverse drive for the reel heads serves to move the cones together for clamping the coil of strip so it may rotate with the drive, and also to permit shifting from side to side for alignment with the mill rolls.

The direct current machines used in this service are usually provided with some form of enclosing covers in order to exclude dirt, dust and other foreign matter. Except in a few instances where semi-enclosing covers have been used, the units are completely enclosed for force ventilation in the larger sizes and are totally enclosed, fan-cooled (or non-ventilated) in the smaller sizes. As shown in Fig. 3, a very compact self-ventilated unit has been developed, utilizing a small alternating current motor driven blower mounted directly on the side or top of the main unit. In some cases the generator is merely supplied with enclosures, with flanged openings, to which may be bolted piping bringing the ventilating air from an external source. This arrangement, however, requires flexible air connections, since the entire unit must move in an axial direction as previously described.

These machines must incorporate the rugged mechanical features of steel mill apparatus and strong electrical design to successfully and reliably meet the varied conditions of motoring while starting, operating under a wide range of speed, dynamic braking, frequent reversal, etc. It is also important that these machines be designed with as low WR^2 as practicable in order that the regulator will be able to maintain tension at the desired value during acceleration and retardation.

To meet the growing demand for units suitable for this special service, the General Electric Co., Schenectady, N. Y., has listed a line of drag generators for feed reel drive in capacities ranging from 15 to 50 kilowatts and for low speed shaft speeds, by convenient increments, from 10.7 to 107 revolutions per minute. The accompanying table contains a tabulation of this line of gear generators, showing the available ratings in kilowatts and revolutions per minute. The gears are suitable for axial thrusts of 100,000 pounds in all except a few of the smaller sizes which have a thrust capacity of 25,000 pounds. The generators in this line may be provided with semi-enclosing covers, top half solid, bottom half perforated, or with completely enclosing covers and optionally may be supplied with a motor driven blower mounted on the frame on the main unit and fitted with a dry air filter on its intake if desired.

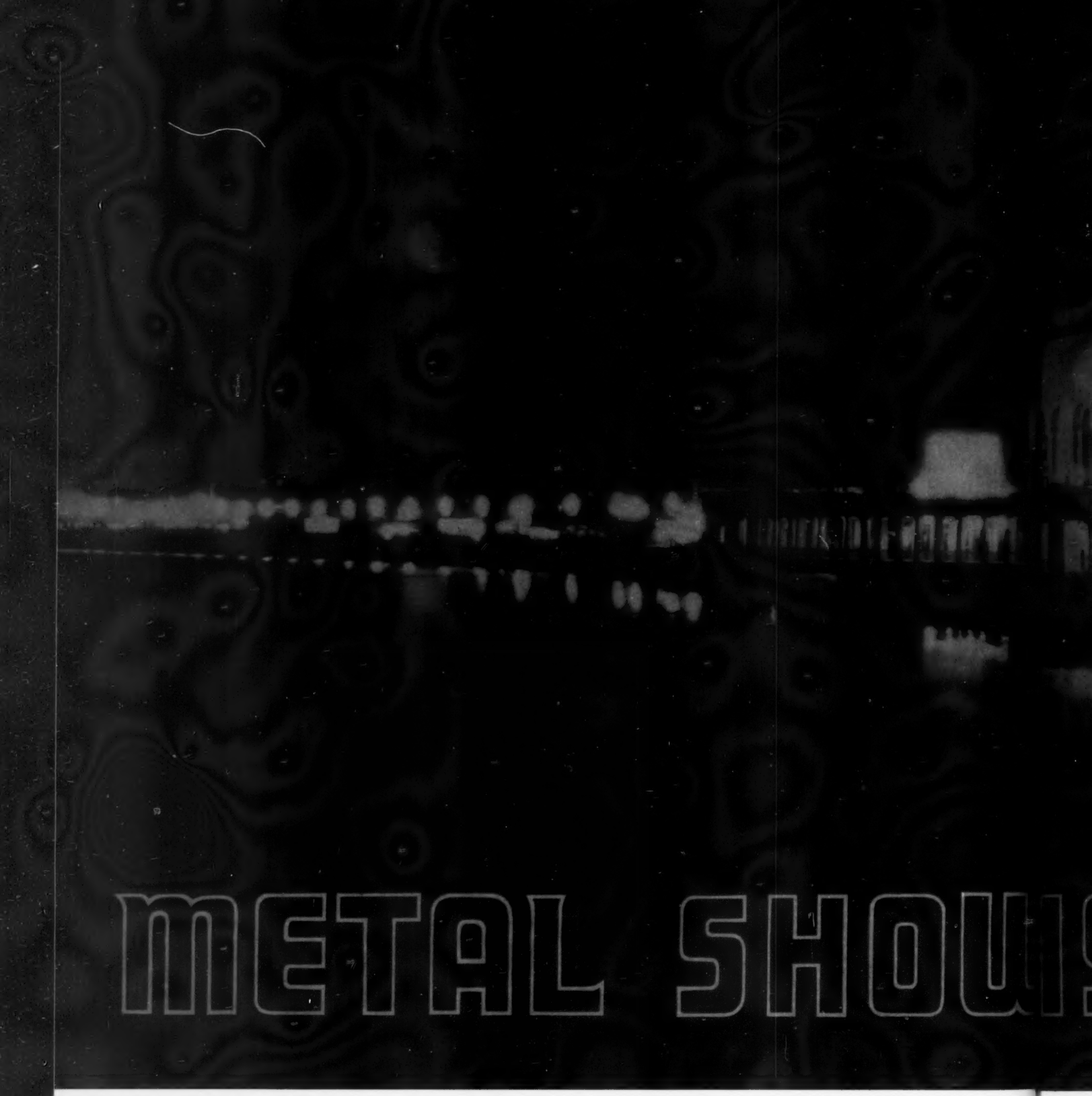
• • •

Exerts Marked Influence

Tests recently concluded in England, show that 1 per cent or more of vanadium added to nickel-chromium or nickel-chromium-molybdenum steel has a marked influence in maintaining almost constant the mechanical properties obtained by tempering the hardened steel within the range of 932 to 1202 degrees Fahr.

Lists Available Literature

Carnegie Institute of Technology, Pittsburgh, has issued a booklet listing the available publications that deal with the mining and metallurgical investigations conducted under the auspices of the institute and mining and metallurgical advisory boards. Also listed are the publications dealing with the physical chemistry of steel making and containing the results of the eight-year research program.



Night view, Atlantic City Auditorium

CLOSING DATES—Final forms will close Thursday, September 30. Reservation and copy requiring composition should be in Cleveland not later than Wednesday, September 15.

METALLURGISTS, metals and methods, together, make the annual Metal Shows events of utmost importance to all those working with metal whether it be iron, steel, copper, aluminum or some other metal.

The 1937 Metal Congress will be held in Atlantic City, October 18 to 22 inclusive. STEEL is working closely with the various interests in order that this show may be well attended and may accomplish its purpose. Our October 11 issue will be devoted largely to these same interests and will be in our readers' hands exactly one week prior to the show—ample time to make plans.

The traditional editorial and advertising insert section, which has proved so valuable over the years, will be a feature of the October 11 issue. This will serve to bring the show to those who cannot attend and will enable those attending to plan in advance the things they wish to do and see, thus insuring that their time will be spent to the best advantage.

Naturally, this studied readership makes for a most extraordinary advertising opportunity. The October 11 issue has all of the elements for successful advertising—timeliness, unusual reader interest, effective presentation to the proper people—plus additional distribution at the show. Write for further details now.

STEEL

Production • Processing • Distribution • Use

CLEVELAND

New York • Pittsburgh • Chicago Detroit • Washington • London

Welding Should Be Held to Required Economical Amount

IN THE design of welded structures it is important to keep the amount of welding down to the required economical amount, according to one of a series of studies in structural arc welding issued by Lincoln Electric Co., Cleveland.

In a riveted member, however, it is not of such prime importance to keep the number of holes and rivets down to the figured minimum. For example, in a tension angle connected by a single rivet the effective section of the angle across the area where the hole is, is decreased by the diameter of the hole. With the same angle connected by three rivets, the loss of section is no greater than before, since the three holes are in line and spaced a short distance apart.

In designing welded structures the welding should develop the stresses, not the material—that is, the stress should dictate the size of the welds. Riveted work has developed its methods and practices from its own inherent nature. Welding has its own pecularities and should logically establish practices that are in line with these peculiarities. It is not just a matter of copying riveting practices.

A bearing stiffener, in a riveted girder, needs a filler plate to make up for the thickness of the angles against the web, as shown in Fig. 1. In a welded girder, Fig. 2, no

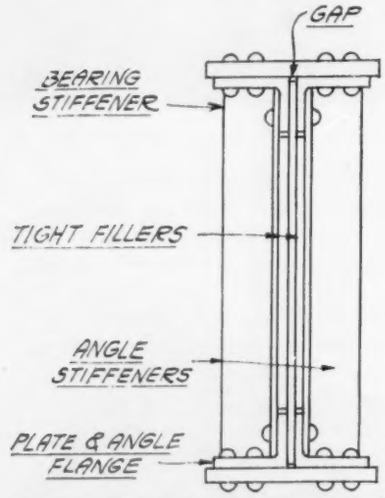


FIG. 1—Riveted girder with bearing stiffener requiring a filler plate to make up for the thickness of the angles against the web

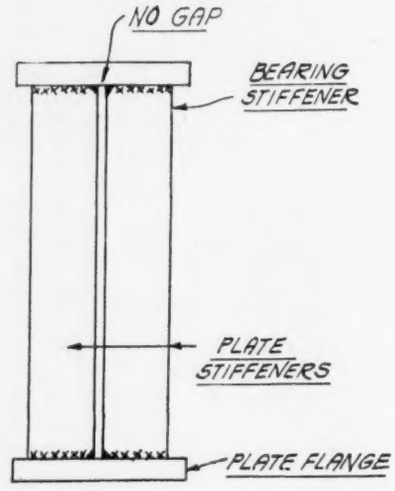


FIG. 2—Welded girder has no angles and needs no fillers

such fillers are needed because there are no angles. In Fig. 1 the top of the stiffener is not connected to the flange; in Fig. 2 it is welded to the flange.

The stiffener in Fig. 1 is an angle, one leg of which is parallel to the girder's web and this leg may not be counted on to transmit a concentrated load to the girder web according to bridge specifications and others. In Fig. 2 all of the stiffener is perpendicular to the web and, since it is direct connected to the flange, all of it may be counted on for transmitting load to the web.

The fact that the plate stiffener in Fig. 2 is welded solid at both ends of the flanges makes it a column fully fixed at both ends. Advantage should be taken of this condition in designing welded stiffeners.

In Fig. 1 the usual set-back of the web plate forms a gap that prevents direct transmission of stress to the web plate. In Fig. 2 no such gap exists, consequently at least a portion of any concentrated load is taken directly into the web. That much less needs to be figured as being carried by the stiffeners. This accounts for a further reduction in material.

Non-bearing stiffeners in a riveted girder, such as shown in Fig. 3, must be attached to the web. In a welded girder the ends of all stiffeners should be welded to the flanges (Fig. 2) to square up the girder and hold it in place during the subsequent welding.

Consequently practically no welding of such non-bearing stiffeners to the girder web is needed, since their only function is to hold in alignment the web which they straddle. Nevertheless, many welded girder drawings come to the shop showing non-bearing stiffeners full-welded to the girder web—a distinct waste of time and material.

In the shops, many welders and inspectors pride themselves on turning out a good job by overwelding. A ¼-inch fillet specified will turn out to be a full ⅜-inch, the two-pass ½-inch fillet called for on the drawings will be almost ¾-inch, and then the shop will call the engineer's attention to the fact that he's "getting his money's worth and then some."

It has been the engineer's business to make allowances for the "human element," for shrinkage, and for all such factors, as well as for the figured stresses in the connections at the time he was designing the job. Consequently the shop should not feel that it is incumbent upon it to add welding to that shown on his drawings. To do so would indicate that the shop does not feel overconfident of the engineer's proficiency in designing the welding nor in the value of its own work. Overwelding should not be encouraged.

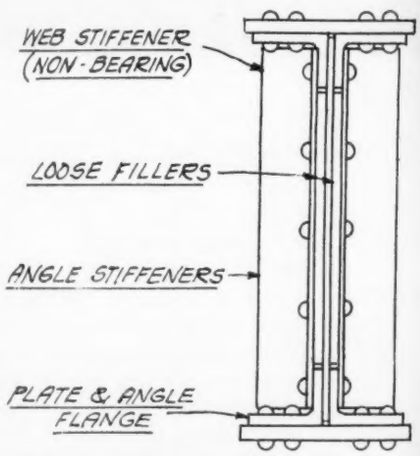
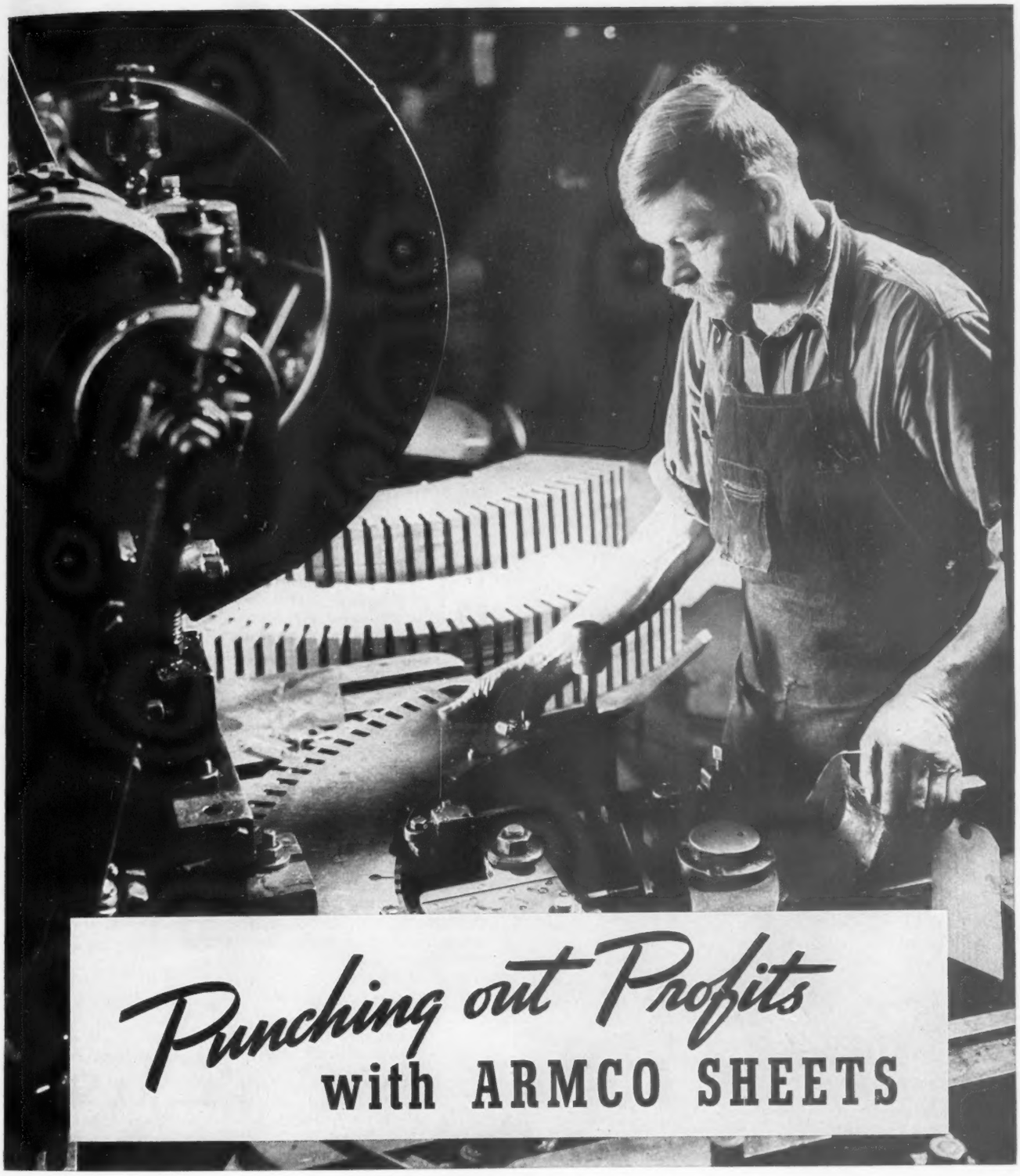


FIG. 3—Non-bearing stiffeners in a riveted girder must be attached to the web



Punching out Profits with ARMCO SHEETS

Whenever Armco Electrical Sheets are used, there you find proof of the economy of this fine, specially-made steel. This is steel that punches clean, stacks quickly and uniformly, and produces peak efficiency in motors, transformers, generators, and other electrical equipment. It has what it takes, thanks to a third of a century of Armco research and development. A trial order will show you exactly what we mean. Just tell us what you make . . . or want to make. The American Rolling Mill Co., Executive Offices: 2040 Curtis St., Middletown, O.

ARMCO ELECTRICAL SHEET STEEL

Plants

ABOVE is the 122 by 442-foot machine shop of American Blower Corp., 8251 Tireman, Dearborn, Mich., engineered by Albert Kahn Inc., Detroit. Clear floor height to underside of trusses is 34 feet, and three 60-foot cranes traverse the entire length of the building. Note large expanse of glass in the walls. Below is the 90 by 150-foot office and manufacturing building of the Partool Machine Co., 9111 Schaefer highway, Detroit. C. E. French of the Sterling-French Machinery Co. is president. A central bay and craneway extends the entire length of the building in the center. The company builds special metalworking machinery for the automotive and allied industries

MODERN industrial plants are a far cry from the sprawling, dark, ill-ventilated structures of 20 years ago. Architects and engineers on these new structures are stressing simplicity of line and beauty of appearance as well as utility. Ample working space, generous use of glass, adequate lighting and good ventilation are characteristics of practically all new plant structures.

From the standpoint of unusual appearance, the illustrations on these two pages typify what is being accomplished in the moderate-size plant. While the buildings shown here are all in the Detroit area, their counterparts are to be seen or are being contemplated in industrial sections throughout the country.

Chief reason why these buildings are so distictive in comparison with older industrial plants is their simplicity of line and the greater portion of wall space devoted to windows. Structurally they present no radical innovations, although the trend toward the use of curved surfaces, especially around entrances, is an interesting departure.

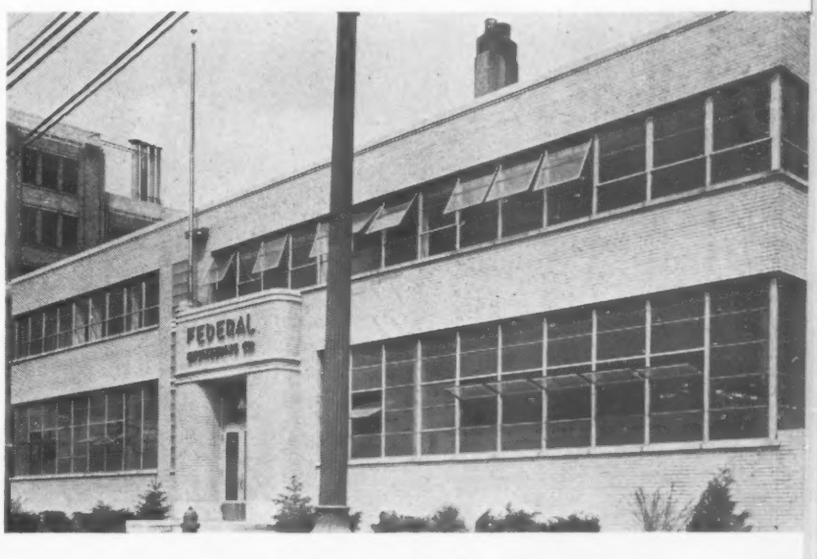
Use of translucent glass block in wall construction,

Keep Pace with Modern Architecture

ABOVE is the front elevation of the Precision Spring Corp. plant, 15400 Woodrow Wilson, Detroit, also an Austin job. The company produces mechanical coiled wire and flat steel springs. Manufacturing area is 150 by 200 feet, with 14-foot clearance throughout. Glass block, stainless steel and ornamental art stone are used on the facade along which offices and engineering departments are located. Plant is enclosed by a continuous steel sidewall sash and has long monitors, the walls of which carry glass on all sides and ventilating units at intervals

as shown in the Precision Spring Corp. building, is a distinctive treatment, providing additional illumination in entrance lobbies without sacrificing structural strength. Other decorative touches include the use of stainless steel trim on copings and for block letters in the company names, and the extensive use of shrubbery to set off building fronts.

Some interesting statistics might be compiled on the benefits to worker morale which these modern structures bring about. Employes both in offices and plants take greater pride in their work and are less apt to become weary when surroundings are clean, airy, well lighted and well styled.



PLANT and office building of the Federal Engineering Co., 850 Oakman boulevard, Detroit, is shown at right. Structure, designed by the Austin Co., Cleveland, is 98 feet wide and 342 feet deep, one and two stories in height. Below is the plant of the Walway Co., 19270 West Eight-Mile road, Detroit. Located on a 4½ acre tract of land, the building is 100 by 150 feet in size. The company supplies stampings on contract and maintains its own tool and die shop

Corrugated Sewer Pipe Has Asbestos-Bituminous Lining

Made possible by a recent development of the American Rolling Mill Co., Middletown, O., corrugated galvanized pipe with bituminous coatings now is being marketed to municipalities for use in carrying sewage while heretofore its use has been confined largely to railroad and highway fields. Several miles of such sewers have been sold, in diameters from 12 to 84 inches and made of sheets ranging from 16 to 8-gage in thickness.

As now made, this corrugated sewer pipe has a layer of asbestos bonded to the sheets. This material is applied under pressure while the zinc coating is in molten condition, causing the fibres of asbestos to be anchored securely in the zinc. The asbestos coating then is saturated with a bituminous saturant after which the sheet is corrugated. These operations are performed at ARMCO's Ashland, Ky., plant where is located the only bonding mill in existence. Then at the plants of the fabricators the sheets are curved to the required diameters and riveted, after which the bituminous coating is applied. Corrugated sewer pipe so protected has been shown, as a result of protracted tests, to resist the attack of sewage and sewer gases. Developed primarily for sewers, this pipe also is being extensively sold in the older highway and railway markets.

Chemistry, Handmaiden of Every Aspect of Life

Man in a Chemical World, by A. Cressy Morrison; cloth, 292 pages, 6½ x 9 inches; published by Charles Scribner's Sons, New York; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Preparation of this review of the great contribution of chemical industry to every human being was an outgrowth of the celebration of the three-hundredth anniversary of the birth of the chemical industry in the United States.

That the chemical industry permeates into every smallest crevice of modern life, in food, housing, clothing, communication, amusement, learning and every department of life, is set forth in great detail.

The volume is written in an entertaining way and goes into the wonders wrought in the production of materials nature forgot to make, the application of nature's laws to providing things needed for civilization but absent from the world as man found it. In places it reads like a fairytale.

To any reader it opens vast fields where chemistry rules, fields which the ordinary human being takes as commonplace, in ignorance of the touch of the human mind in altering the course of nature.

Gear Makers Announce Fall Meeting Program

Considerable diversity of program is being arranged by the American Gear Manufacturers association for its twentieth semiannual meeting at the Spink-Wawasee hotel, Lake Wawasee, Ind., Sept. 20-22. In addition to several business and technical sessions and a dinner, time is provided for sports and entertainment.

Papers scheduled on the program are as follows:

"Torch Hardening Method for Gears," by W. E. Sykes, Farrel-Birmingham Co. Inc., Buffalo.

"Relation Between Microstructure and Machinability of Gear Steels," by Dr. N. E. Woldman, Eclipse Aviation Corp., East Orange, N. J.

"Roller Tests to Determine Pitting Fatigue Strength," by Dr. Stewart Way, research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"The Credit Situation," by Paul Fielding, National Credit association, Chicago.

'Electric Motors," by L. R. Botsai, Nutall Works, Westinghouse Electric & Mfg. Co., Pittsburgh.

"Valuation of Jobs Based on Community Rates," by A. S. Crockett, General Electric Co., Schenectady, N. Y.

"Our Relations with Other Associations," by T. P. Rideout, Nutall Works, Westinghouse Electric & Mfg. Co., Pittsburgh.

An address by a national authority touching present and pending legislation affecting industry will be one of the highspots of the meeting. In addition to the scheduled papers, the program includes numerous reports of standing committees.

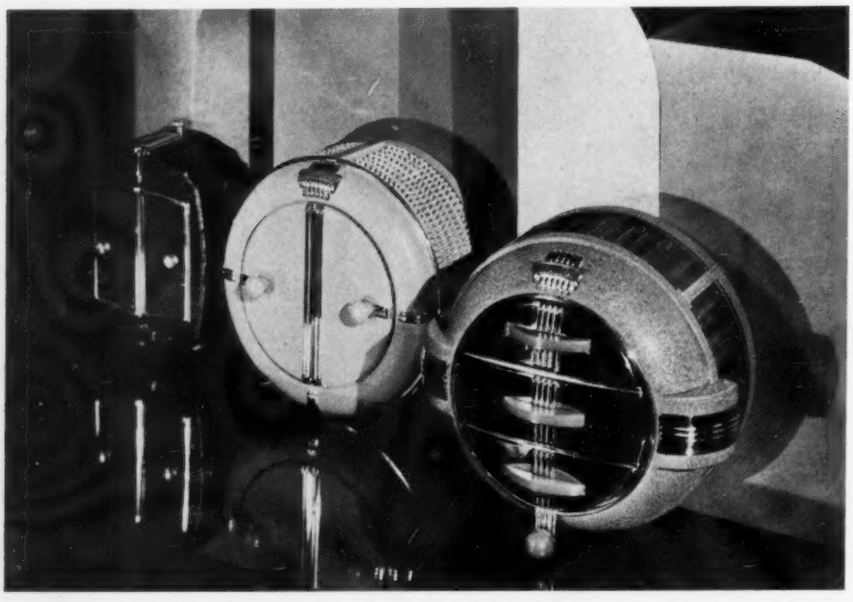
H. H. Kerr, president, Boston Gear Works Inc., North Quincy, Mass., is president of the association, and J. C. McQuiston, Penn Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

Adds Magnesium Alloys

Doehler Die Casting Co., Toledo, O., has announced the addition of magnesium base alloys to its list of die casting alloys which includes tin, lead, zinc, aluminum and copper base alloys.

The company has standardized on three magnesium alloys having a tensile strength up to 35,000 pounds per square inch and an elongation up to 10 per cent, although other alloys are also available to meet special service requirements.

Turn on the Heat in the Latest Style



Progressive steps in the design of automobile heaters are shown here in products of the McAleer Mfg. Co., Detroit. From left to right are styles in heaters which the company offered for 1936, 1937 and 1938, the latter just started in production. The unit at the left is the one built before calling on the services of an industrial designer, the other two were designed and styled by George W. Walker, well known Detroit industrial designer. In the newest model the bright finished parts are chrome plated zinc die castings, the case comprises steel stampings with crackle-finish in a variety of colors, handles are red molded plastic. Feature of the design is that the entire door unit may be rotated to any position by means of the knob at the bottom, and each of the three doors may be opened independently. Ears at the sides, in addition to providing a decorative touch, are outlets for connecting windshield defroster hoses

POWER DRIVES

Two-Speed, Low-Speed Drives with Automatic Interlocking Control

AN INTERESTING application of two-speed reduction units interconnected and with separate motors to give high operating torque at both speeds is incorporated in the drive installation to two lock gates under construction at the mouth of the Chicago river.

The four drive units, one for each of the four gate leaves, utilize the unique characteristics of the heliocentric principle reduction units to fulfill certain design objectives. The complete unit is 90 inches high overall and 47 inches in diameter at the base.

Specifications called for a 2-speed drive unit equipped with a 25-horsepower, 1200-revolutions per minute motor capable of providing 300,000 inch-pounds torque to the output shaft at a drive speed of approximately 3 1/3 revolutions per minute. Provision is also made for connecting to the same output shaft a 1½-horsepower, 1200-revolutions per minute motor capable of imparting 450,000 inch-pounds output torque at a drive speed of one revolution in approximately 25 minutes.

The cycle of operation is as follows: for opening the gates the output pinion is operated at slow speed for a predetermined time, depending on the differential water head in the locks. The larger motor, geared for faster opening speed, then cuts in automatically without loss of tooth load and operates to within a very small arc of fully-open position when the larger motor is cut out by means of a limit switch. The small motor completes the final movement of the lock-opening cycle and is cut out at full opening by a limit switch.

On the gate-closing cycle, the high speed drive is used from the start and continues until the gate leaf has nearly reached a fully-closed position, when the large motor cuts out and the smaller motor cuts in to complete the final travel of the leaf at very slow speed and without shock.

Contactors and switches are of standard design and are adjusted to provide automatic operation when push buttons are pressed to start opening and closing cycles. A third push button for emergency use stops operation at any point.

Operate Both Motors

While the small motor imparts a driving speed but one eighty-fifth of that provided by the large motor, both motors could be operated at the same time without damage. To understand the operation of the two distinctly different drive mechanisms it is necessary, however, to know something of the heliocentric speed reduction principle.

The heliocentric reducer has three main elements: (1) an input shaft carrying an eccentric; (2) a battery of reciprocating plungers operated by the eccentric, the plungers being carried in a slotted holder that is integral with the output shaft; (3) a rack, resembling an internal gear, into which the plungers slide, causing the output to rotate at reduced speed, namely, through the arc of one rack tooth for each plunger cycle or single revolution of the input shaft.

Normally, the rack member is stationary and keyed to the reducer case. In the lock drive unit, however, the internal rack is of bronze, is rotable in bearings, and in this design is machined on its outside

THE heliocentric input shaft, which is direct connected to the large motor, remains idle while the small motor drives the internal gear rack. When the large motor drives the shaft the worm holds the rack stationary. Either or both motors may operate without damage

diameter as a worm gear that meshes with a worm driven by the 1½-horsepower motor through a gear train, shown on the side near the bottom of the unit. The construction of this is similar to a standard gear-motor with a step-down of 181 to 1 up to the pinion gear drive which carries an additional helical gear reduction of 4.03 to 1 meshing with the large gear carried at one end of the large worm shaft. The worm gear then turns the final output drive shaft of the complete unit through a total ratio of approximately 30,000 to 1. In order that the major output shaft be driven in this manner, the worm gear, which is the same part as the heliocentric rack, is revolved and carries the plungers and holders with it. The 25-horsepower motor mounted at the top of the unit, however, does not revolve, since it is held stationary by a magnetic disk brake mounted at the top of the motor.

Rack Is Stationary

When the large motor starts to operate, the magnetic brake releases and, since the small motor is inoperative, the heliocentric rack is held stationary, due to the self-locking action of the worm gear. The large motor and reducer then operates normally for heliocentric reducers and drives vertically on a straight-line through a total reduction of approximately 350 to 1. As previously stated, however, both motors can be operated in the same or opposite directions to each other and the net result in drive would merely be the sum, if operating in the same direction, of the speeds that each imparts to the output shaft. If the small motor is operated in opposite direction, its output speed would be subtracted from the speed imparted by the large motor.

It is stated that no other design of speed reduction, except the heliocentric principle, would be applicable to the interlocking effect of two separate drives working into a common output shaft, without resort to some form of dual clutching and declutching devices. This same general principle of integral worm-gear and internal gear design is also utilized in heliocentric valve operators, another recently perfected design whereby a gate or sluice valve may be operated either by manual wheel through worm reducer or by motor through heliocentric reducer.

The four drive units were manufactured by Universal Gear Corp., Indianapolis, Ind., for the Frazier-Davis Construction Co., which is installing the locks.

♦ ♦ ♦

Preventing Overlubrication

OVERLUBRICATION of antifriction bearings is responsible for much more bearing trouble than is charged against the practice.

To the man who has been taught all his life to oil "plenty and often", periodic lubrication doesn't seem to be satisfactory. About the only method of preventing overlubrication under such circumstances is to take the grease gun away from him and put lubrication under the direct charge of the maintenance department.

Applying lubricant periodically is one method of preventing overlubrication, if the servicing period is properly timed. To prevent applying too much lubricant is one reason for recommending periodic attention. However, unless care is exercised in the refill, too much lubricant may easily be supplied. This is particularly the case with grease applied under pressure. This may be prevented by insisting that only a definite number of strokes or turns be made, depending on the size of the bearing, but performance is difficult to check.

The use of low-pressure grease guns on ball and roller bearings will prevent building up pressure in the bearings. One such gun has a special back-pressure nozzle which will build up a pressure of only 2½ ounces per square inch, instead of 1000 pounds or more, and, if the gun is continued in operation, discharge the surplus grease through special openings in the nozzle so that the operator can see that the bearing is full. One user reports that these guns not only save time in application but also decrease the amount of lubricant used.

♦ ♦ ♦

The emergency maintenance squad is like a fire department; the less it has to do the better off everyone is. Also, the more quickly and expertly it does its duty when called on, the more credit it deserves.

♦ ♦ ♦

With properly designed drives, satisfactory operation becomes a routine problem of inspection, servicing and maintenance.

♦ ♦ ♦

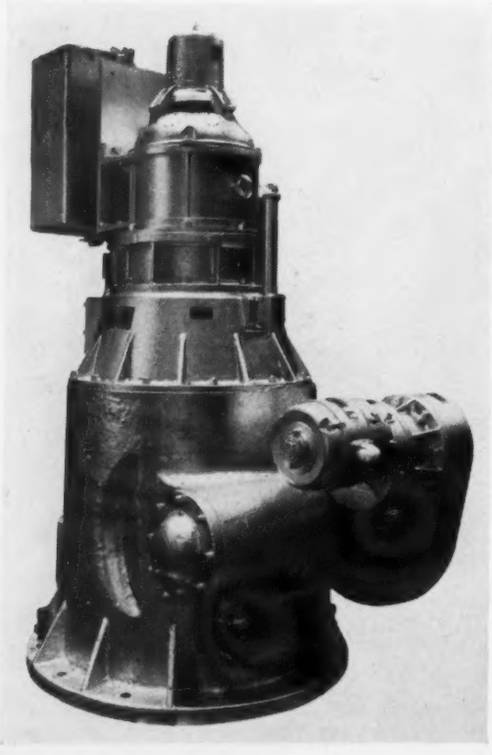
Before condemning any type of drive unit, carefully check over the installation to see whether the drive is properly designed and installed or subjected to misuse or abuse.

♦ ♦ ♦

Every second year each motor in one plant is thoroughly cleaned, checked for electrical and mechanical defects and the winding lacquered. Using a different colored lacquer each year indicates the approximate age of the servicing without consulting the card file.

♦ ♦ ♦

Theoretically a particular drive setup may appear to be ideal; however, from a practical operating standpoint it may not be satisfactory. The best type of drive for the purpose is a balance of theory and practice, where the two conflict.



THE vertical shaft starts to open the lock leaf at extremely low speed and high torque with the small motor on the side. When in motion the large motor at the top cuts in to complete the opening cycle at higher speed

SIGNS OF THE TIMES

As trucking costs rise and legal road weights fall, don't be forced to leave your payload behind, on the shipping platform. Increase your load and your profit with it, yet stay within the law—cut dead weight by using Yoloy.

Yoloy is Youngstown's special low-alloy steel—25% to 40% lighter than ordinary steel of equal strength, 4 to 6 times as resistant to corrosion, and far more resistant to fatigue failure. Truck bodies, cars, road machinery, trailers of Yoloy change dead weight into pay load. Every pound that Yoloy saves is a direct addition to net profit. Tell us what you are carrying, and we'll tell you how much Yoloy would let you add to your pay load. Every day your needless dead-weight is costing you money. Write for the Yoloy story today.

YOLOY
TRADE MARK
YOUNGSTOWN
STEEL

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

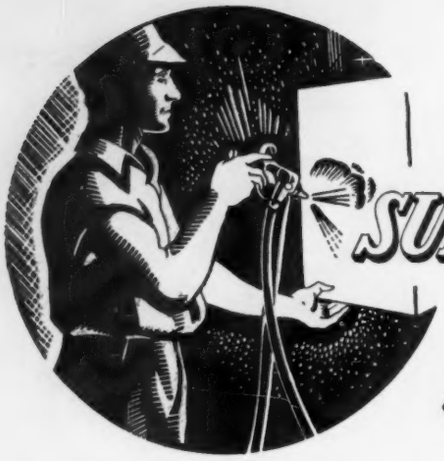
General Offices: Youngstown, Ohio

•

High Tensile Steel Yoloy is available in sheets, strip, plates, bars, shapes, manufacturer's wire, welding wire, seamless pipe and electric weld pipe.

3-2

YOUNGSTOWN



SURFACE TREATMENT AND FINISHING OF METALS

Nickel And Chromium Plating Technique Advanced by Research

TECHNIQUE of nickel and chromium plating steel has advanced so greatly as a result of research during the past few years that new uses are being applied in several different branches of the steel fabricating industry, effecting improvements in both appearance nad utility.

One such development has placed steel in the household field. The Eaton-Detroit Metal Co., Massillon, O., manufacturers of chromium-on-nickel plated automobile parts and other articles, has recently developed a kitchen skillet with new properties which is making a place for itself in this highly competitive market.

The steel used is fully cold rolled, No. 3 finish. The gages vary with shape and quality of the skillet but are heavier than the average stamped steel job, running around 0.050-inch. The important improvement over other skillets lies in the finish which is a modification of the chromium-on-nickel used on automobile parts. This finish gives several useful properties to the skillet. First, it is attractive on the shelves of department and hardware stores and needs no protective lacquer or special handling for its preservation.

Sticking and Burning Reduced

When put in use in kitchens this finish reduces the tendency for sticking and burning of foods. The distribution of heat by the heavy gage steel puts it in the class of heavy skillets in cooking efficiency but the actual weight is in line with lighter kitchen ware rather than cast ware. The "passive" nature of the finish makes the skillet easy to clean after use and preserves the bright clean appearance of the kitchen. Odors or tastes are not retained.

The process has been modified so that buffing of the nickel is dispensed with and an entirely suitable inside finish is obtained without any mechanical operations. The finish is produced in the ordinary sequence of chemical and electrolytic cleaning and plating operations. Polishing and buffing is applied to bring the outside finish back to a high luster where it has been affected by heavy pressure in the drawing dies.

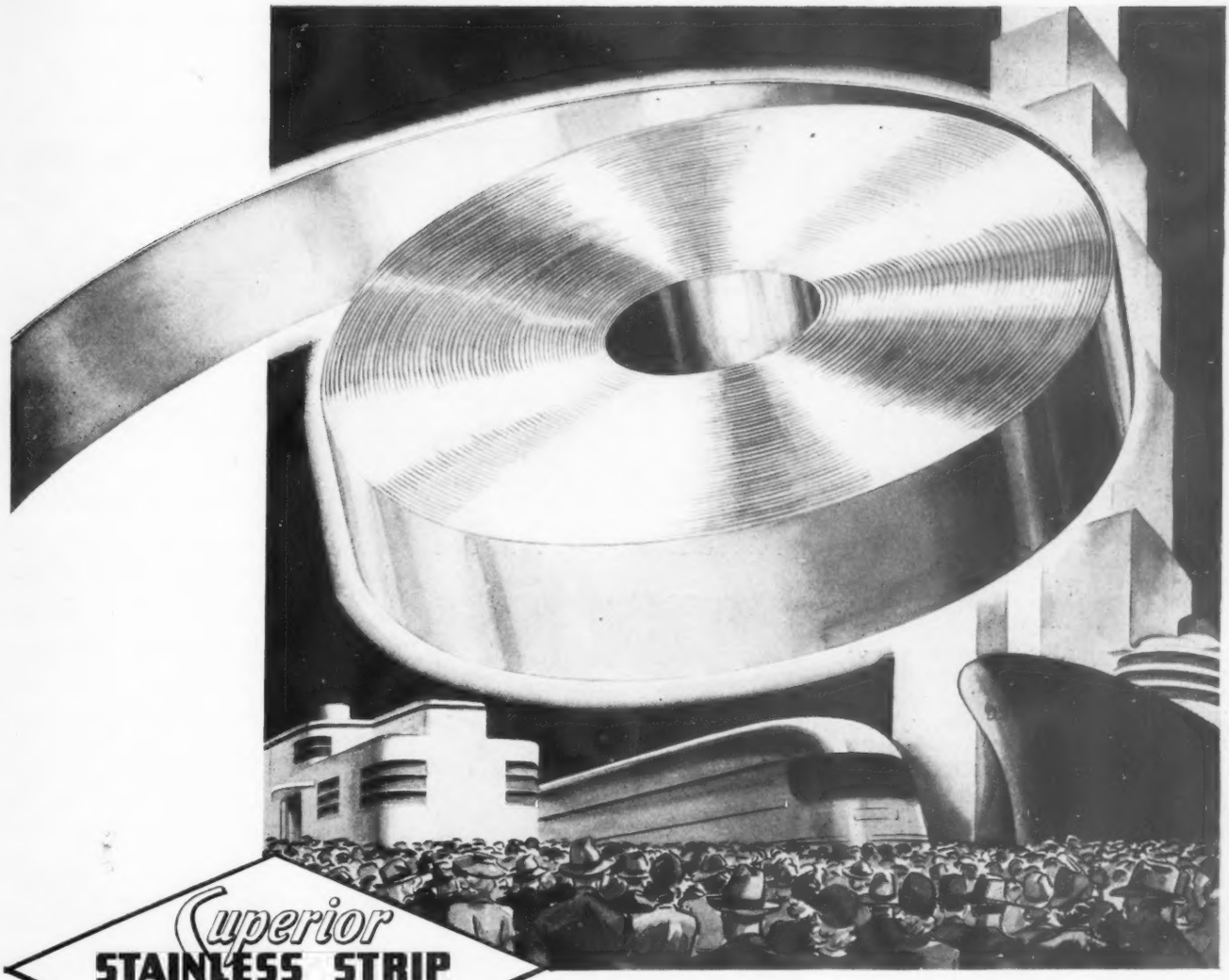
A clever switch arrangement on the nickel plating anodes permits control of the thickness of nickel applied to different areas. This is ordinarily used to put a heavier deposit on the inside of the skillet which gets the most service wear.

Germans Experiment with New Types of Finishes

An intensive effort is being made in Germany to substitute German raw materials for foreign materials especially linseed oil. The most popular materials being used are syn-

Checks Silver Coating on Headlamp Reflectors

SURFACE finish on Plymouth headlamp reflectors is a layer of pure silver on which a regular check must be made to determine whether the coating meets standard requirements. The silver is stripped off as shown by dissolving in nitrosulphuric acid, then is precipitated, filtered, dried, weighed and calculated in terms of pure metal

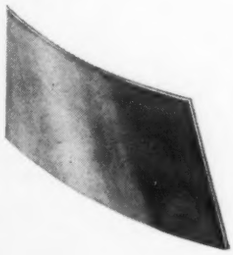


Superior STAINLESS STRIP Steels

Accepted by Millions!

Private citizens by the million have enthusiastically accepted stainless steel as a mark of quality in the products they purchase.

If you are not using stainless steels as fully as you might in the products you manufacture—whether these products be for the private consumer, or the industrial consumer—try SUPERIOR Stainless Strip Steel.



A half century of experience in producing hot and cold rolled strip steel has given us intimate knowledge of what strip steel users require. SUPERIOR Stainless Strip is but one indication of how we are meeting those needs.

If you have a special problem let our engineers help you.

SUPERIOR STEEL CORPORATION

GENERAL OFFICE: GRANT BLDG., PITTSBURGH, PA. WORKS: CARNEGIE, PA.

SALES OFFICES

3002 GIRARD TRUST CO. BLDG., PHILADELPHIA, PA. 2403 CHRYSLER BLDG., NEW YORK CITY, 1017 FISHER BLDG., DETROIT, MICH., 122 S. MICHIGAN BLVD., CHICAGO, ILL., STEEL SALES CORPORATION, 129 S. JEFFERSON ST. CHICAGO, ILL., H. L. BROWN, 2001 CAREW TOWER, CINCINNATI, OHIO; BRUCE DONALD, BRANTFORD, ONT., CANADA; J. J. BYRNE, AVENUE BLDG., 4560 EUCLID AVE., CLEVELAND, OHIO

BRACE-MUELLER-HUNTLEY, INC., 130 SOUTH ELMWOOD AVE., BUFFALO, N. Y., 983 LYELL AVE., ROCHESTER, N. Y., HILLS BLDG., SYRACUSE, N. Y.

thetic resins and chlorinated rubber. For wood impregnation, a triple dip in varnish containing linseed oil has been replaced by a double dip in a nitrocellulose varnish, which is suitable for all types of wood. For the coating of steel wires, tung oil-copal varnishes have been replaced by synthetic resin varnishes which do not contain more than 5 per cent oil.

For the testing of asphalt and bituminous varnishes, use is made of the Kempf apparatus which measures the penetration of a loaded diamond. The shock resistance of protective coatings is tested with two small cylinders, one coated and one bare. The former is held in the left hand and struck with the latter so that the two pieces form a cross. The amount and nature of the damage to the film is noted and recorded. In the case of chlorinated rubber finishes, the tests are not made until seven days after the preparation of the film, since they hold traces of the solvent for extended periods.

As is known, the use of copper or copper compounds is harmful in protective paints for aluminum or other light metals and their alloys, whereas zinc oxide is beneficial and is contained in nearly all the paints which have been accepted by the German navy. Nearly all the paints tested by the German navy contained synthetic resins to some extent. The least combustible paints are those containing aluminum but their use is restricted for other technical reasons. There is still a demand for a paint which is more flameproof than those available at present.

Compact Instrument Tests Finishes

A COMPACT, portable precision testing machine for measuring wear resistance, toughness, adhesion and rub-off qualities of enamels, electroplate, anodic finishes, linoleum, molded plastic sheets and leather coverings has been developed by Taber Instrument Co., North Tonawanda, N. Y.

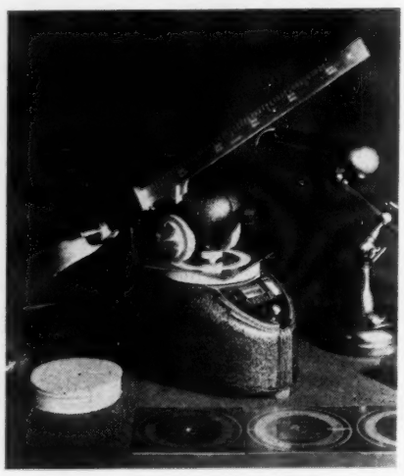
This instrument, known as the Tober Abraser, is equipped with a power-driven specimen holder, a reset counter, two ball-bearing pivoted pendulum arms on which are mounted wheels made of a special resilient abrasive composition and a contour blade mounted on a scale beam.

The wheels are offset relative to the center of the specimen holder, resulting in a unique criss-cross abrading action as one wheel rubs from the inside of the wear pattern outward and the opposite wheel from the outside inward. This action is comparable to the wear that materials receive under actual service conditions, more so than the impact type of test where abrasive grit is dropped from a considerable height through a small bore tube against the specimen.

A motor drives the specimen through approximately 50 wear cycles per minute and ordinary materials have a range of 100 to 2000 wear cycles—a 2 to 40 minute test—depending on their durability. Life of the abrasive wheels averages better than 50 tests depending of course on the type and durability of the materials tested.

Scale Arm Measures Adhesion

The contour blade and scale arm are for the purpose of testing dig resistance, toughness and adhesion of enamel finishes. The blade, which is tungsten carbide tipped, removes the enamel coating down to the base



FINISH testing machine with abrading wheels in working position on test specimen. Scale arm and contour blade for testing adhesion is in raised position

metal under a loading indicated on the scale beam. Toughness is rated by the load required to drive the tool completely through the coating. Poor adhesion is indicated when the enamel chips away from the specimen plate as the sharp edge removes the coating. Continuity of the shaving is also an indication of elasticity of the enamel finish.

Smudge and rub-off test equipment are accessory equipment which may be quickly assembled for comparing enamels, metallic printing inks, chalking of paint and enamel finishes undergoing outdoor exposure tests and many others. The same attachment, which has one square inch of surface held in contact under 2 kilogram load, provides a means for determining print resistance of varnishes and enamel finishes.

This machine is useful not only to technical men in the laboratory but also to salesmen who can use it in the field.

Air Circulation is Vital In Enamel Oven Operation

Air circulation in enamel baking ovens is vital. Much trouble has been caused in some finishing departments through the mistaken attempt to economize on heat by closing some of the vents on the baking ovens. Cases have been known where workmen or subforemen have closed such vents without consulting their superiors causing considerable expense on the part of the management in tracing down the reason for the finishes suddenly coming from the oven in a soft, poor condition.

Location of outdoor exhaust vents has been known to cause ventilation difficulties in some cases. Exhaust vents should always extend ell above water tanks, elevator housings and similar obstructions. Cases have been known where outdoor vents were located in such a position that when the wind blew from a certain direction exhause from the oven was impossible. The use of a dutch helmet on a vertical vent solved the difficulty in each case.

Chlorinated Rubber Coatings Resists Acids and Alkalies

Protective coatings containing chlorinated rubber and acid and alkali resistant plasticizers are now offered for the effective protection of plant and equipment against corrosion by May Products Co., Newark, N. J. Various types are available which are claimed to be acid, alkali and moisture proof. Practical long range tests are said to have proven the value of these coatings for the protection of metal, wood and concrete surfaces.

Use of Gas Radiant Tube Enamel Furnaces Increase

Firms recently contracting for continuous porcelain enamel furnaces fired with gas radiant tubes include the George D. Roper Company of Rockford, Ill., and Servel, Inc., of Evansville, Ind. A gas radiant tube furnace for porcelain enameling has just been completed at the George M. Clark Divison of the American Stove Company, Harvey, Ill. The swift acceptance of this new type of furnace in the porcelain enameling and other industries is one of the outstanding industrial trends of the day.

The Process of Magnetic Separation

THE manufacturing of magnetic separators has received remarkable impetus in the last fifteen years. Previous to that period it consisted largely of magnetic pulleys which could be set at convenient places in a conveyor system for the purpose of removing tramp iron before the material reached the crusher or pulverizer.

Constant research and development in the science of applying electromagnetism has in the last ten years produced extensive varieties, designs and uses for magnetic separators, many of them undreamed of ten years ago. Problems

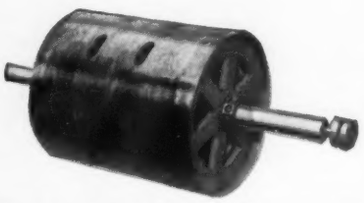


Fig. 1—Simplest type of magnetic separator is the magnetic pulley

in various industries submitted to magnetic engineers have been responsible in a large measure for the widespread application of the science of magnetic separation.

Of the many applications of magnetic separators may be mentioned:

(1) The removal of magnetic impurities from material, the quality of which is imparied by the impurities.

(2) The reclamation of iron from waste material or foundry refuse.

(3) The concentration of rare minerals and ores are made possible by the magnetic separation process.

(4) The removal of tramp iron from conveyed material which is to be crushed, ground or pulverized.

Whenever a product which contains pieces of iron or steel is to be crushed, ground, or pulverized, machinery may be easily damaged. When tramp iron gets into a crushing or grinding machine, sparks are created which can easily ignite combustible material or gases developed in the machines. The resulting explosion may damage the machine or entire plant and fires are likely to ensue. Possible damage to machinery is an important item.

Many of the disastrous flour mill and feed mill explosions came about in this way. Fires in coal pulverizing plants are often brought about in a similar manner. Stock feed, from which scraps of iron are not removed, often causes the death of valuable animals. Iron of abrasion developed from grinding and pulverizing operations if allowed to remain in the product, frequently impairs its quality.

In glass plants, for instance, the batch often contains small particles of both tramp iron and iron of abrasion. Unless these particles are removed, the glass when remelted will discolor. Silica sand used in the processing of high-grade glassware, for instance, requires very low iron content. The purifying of this product requires a special type of gravity induction magnetic separator equipped with as high as seven stages of magnetic fields to treat the material successively as it cascades through the machine. This is a difficult separation application that has been successfully developed by magnetic equipment engineers.

Brown spots and other discoloration in pottery and other ceramic products are generally caused by iron particles which were not removed. Insulating strength is greatly lowered if iron is not entirely eliminated from insulating material.

Iron and steel foundry operations create large amounts of refuse, including floor scrapings, shipping room dirt and cupola cinder, each of which contain relatively large percentages of iron. This iron is wasted unless it is separated from the other refuse. When separated, it can be profitably recharged and resmelted. Foundries not equipped with magnetic separators for removing this valuable by-product dispose of the refuse material in foundry dumps.

Many ores are subject to magnetic concentration. Relative magnetic force on ores and minerals amenable to magnetic separation include:

Apatite	.21	Magnetite	40.18
Argentite	.27	Manganite	.52
Arsenopyrite	.15	Molybdenite	.23
Barium	1.94	Molybdenum	.603
Biotite	3.21	Niccolite	.04
Bornite	.22	Niobium	1.75
Calamine	.51	Orpiment	.24
Calcite	.03	Orthoclase	.05
Celestite	.10	Palladium	5.20
Cerargyrite	.28	Phlogopite	2.40
Cerium	15.35	Phrasodium	25.20
Cerussite	.30	Platinum	.90
Chalcocite	.09	Potassium	.58
Chalcopyrite	.14	Pyrite	.23
Chromium	3.16	Pyrolusite	.71
Cinnabar	.10	Pyrrhotite	6.69
Corundum	.83	Quartz	.37
Cryolite	.05	Rubidium	.07
Cuprite	.08	Ruthenium	1.08
Dolomite	.22	Rutile	.37
Enargite	.05	Senarmontite	.05
Erbium	32.27	Siderite	1.82
Fluorite	.11	Silicon	3.22
Franklinite	35.38	Smithsonite	.07
Galena	.04	Sphalerite	.23
Garnet	.40	Stibnite	.05
Gypsum	.12	Strontium	3.38
Hematite	1.32	Talc	.15
Iridium	1.29	Tantalum	.81
Iron	100.00	Tetrahedrite	.21
Ilmenite	24.70	Thorium	.08
Leucite	34.62	Titanium	1.24
Limonite	.84	Tungsten	.252
Lithium	.50	Willemite	.21
Magnesite	.15	Witherite	.02
Magnesium	.837	Zincite	.10
Manganese	8.93	Zircon	1.01

Many other separations are being

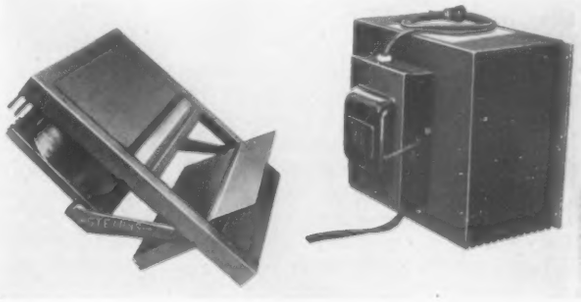


Fig. 2 — Safety spout type of stationary magnet

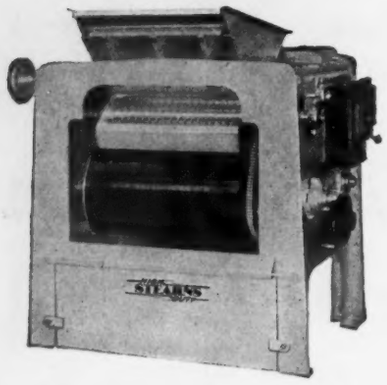


Fig. 3—Drum type separators are made in varying designs

made magnetically including the concentration of abrasives.

Different types and sizes of magnetic separators of widely varying characteristics are needed in different industries. During the past 30 years, numerous types of machines have been developed and applied. Most of them are now constructed in a variety of sizes to meet individual plant requirements.

The magnetic pulley, Fig. 1 is one of the simplest and most widely used types of separators. It consists of a shaft and a cast dynamo steel core wound with concentric coils of insulated wire which are energized with an external source of direct current power. It is installed as a head pulley on a belt conveyor.

The surface of the pulley is strongly magnetized. When material is passed over it, the magnetic particles are held tightly against the belt until the belt leaves the pulley. This diverts the magnetic pieces or particles from the regular gravity flow of the main body of material thus effecting the desired separation. Magnetic pulleys are built in different sizes to accommodate various widths of belt and to develop varying magnetic strength.

Use Magnetic Pulley

Another simple type of separator is the suspension type magnet. This may be of the circular, square or rectangular design. It consists of a horizontal coil imbedded in a soft steel core. Because of its compact design and localized flux distribution, it is often employed as a lifting magnet for conveying heavy scrap material and various iron and steel products.

Under normal conditions, a magnetic pulley is to be preferred instead of a suspension magnet. However, when the depth of the material is great or the conveyor speed is high, it is sometimes desirable to use a suspension magnet in addition to a magnetic pulley. The former will pick up pieces of tramp iron resting on the surface of the material, and the magnetic pulley will dislodge pieces which have settled lower in the burden.

The safety spout type of stationary magnet, Fig. 2, consists of an inclined trough or chute fitted with an electromagnet for extracting magnetic material. A separator of this type is periodically cleared of accumulated scrap by an automatic take-off which mechanically removes the iron as it collects upon the magnetized section. Devices of this character are manufactured in a number of sizes and designs and are extensively used for removing tramp iron from grain and miscellaneous products. Safety spout magnets of this type are becoming more in demand in the coal field because of the increasing use of stokers and pulverizers which by nature of their feed require coal which is free from tramp iron. This problem also is prevalent in many other industries that have found safety spout type magnets of practical and efficient use.

Separators of the drum type are

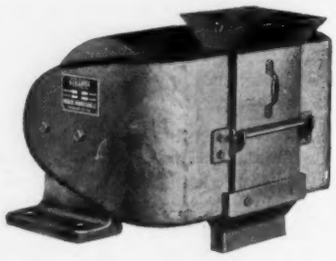


Fig. 4—Wet type separators are widely used for separating iron particles from liquid or semiliquid material

of different design. In the one design, Fig. 3, magnetic material passing over a revolving drum, within which is a stationary magnet, is held against the surface until separated from the magnetic material. It is then released and the separation accomplished.

A wet type separator, Fig. 4, extensively used for removing particles of iron from clay slip and other liquid or semiliquid substances, consists of a magnetically induced cartridge filled with special screens or filters through which the material to be treated is run and the iron particles are thus removed. This type separator finds its widest application in the pottery industry, especially in these days when so many modern colors are being introduced into the various products made by the firms in that business.

Another type of machine extensively employed is of the belt type and consists of one or more stationary magnets across the poles of which a conveyor belt is passed. Motion of the belt is usually parallel to the lines of force. Magnetic material is caused to cling to the belt as it passes from one pole to another and is finally released from the belt when the last magnetic pole is passed. Several types of this kind of separators have been designed and put to use.

Cross belt separators are somewhat different from the plain belt type. They usually consist of two or more bi-polar electromagnets, one above the other, with the main conveyor belt passing between the poles parallel to the lines of force of the magnetic circuit. The poles of the upper magnet are wedge-shaped and the lower ones flat.

Magnetic material passing along the main belt is attracted to the upper wedge-shaped poles. Two or more cross belts or take-off belts are interposed between the main belt and each upper pole. These cross belts travel at right angles to the main belt. The material which is attracted towards the upper poles is therefore intercepted, carried to one side and dropped into suitable receptacles. This type of machine is usually made very powerful. It is often used for separating weakly magnetic ores.

A machine, Fig. 5, having a magnet or alternating pole construction with additional features which permit of jigging the ore is used when treating by the wet process. The ore is ground considerably finer and is spread onto the moving conveyor having raised edges, forming a trough.

Water Washes Ore

One or more sprays are used and a quantity of water is thus made to pass through the ore as it is moved backward and forward crosswise on the moving conveyor while passing from pole to pole of the magnet. High agitation is accomplished as the ore thus is turned over and over, allowing the water to wash free from the ore all gangue matter. The latter moves in a downward direction, while the trough conveyor moves in an upward direction carrying the magnetic portion of the ore

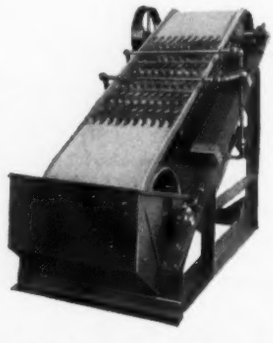
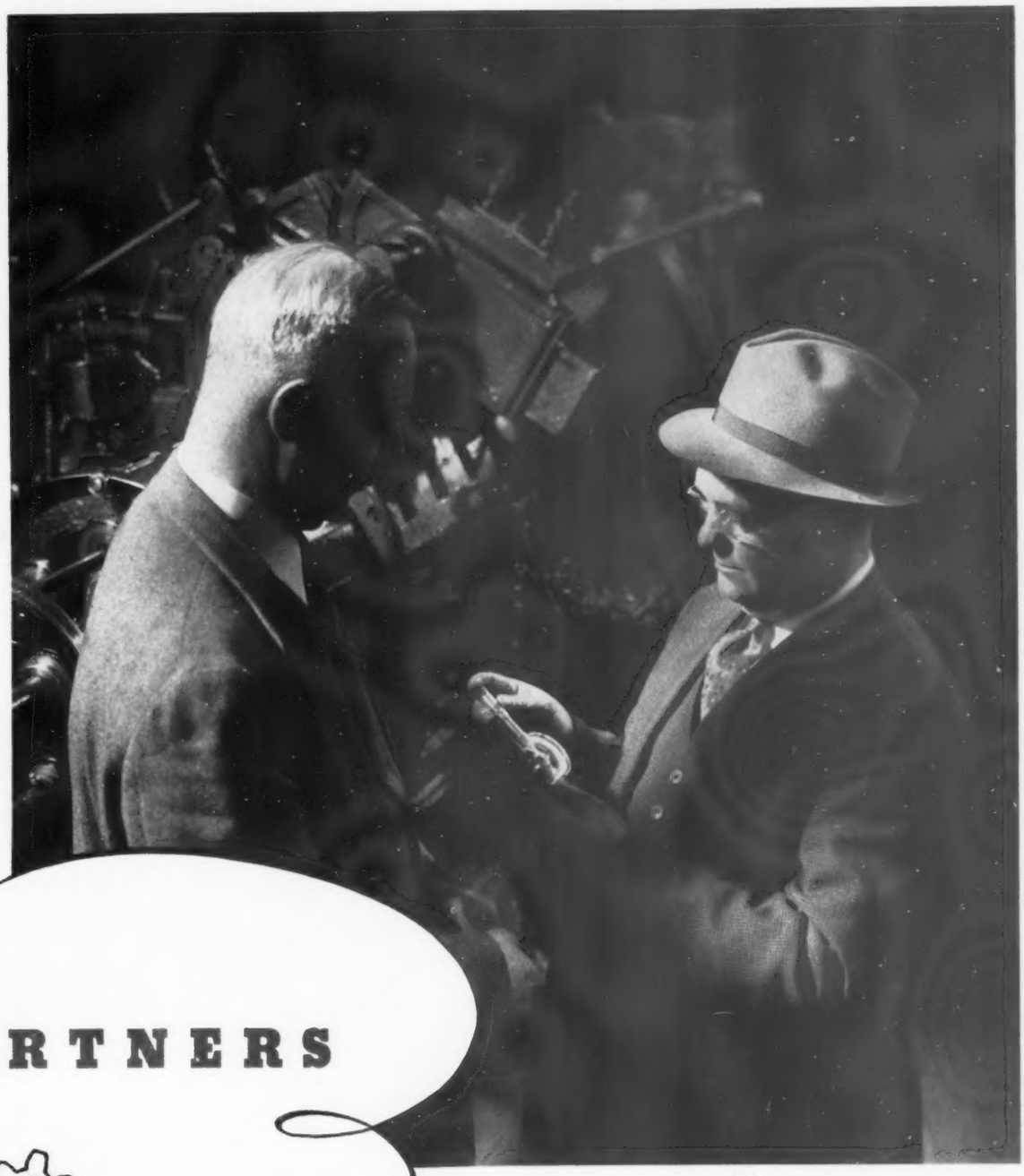


Fig. 5—This machine has a mechanism which permits jigging in addition to magnetic separation



PARTNERS

HERE is a familiar scene in American industrial plants today—the Gulf lubrication engineer working in cooperation with a plant man who is responsible for production.

Both have a definite objective: To get the most efficient lubrication possible for every bearing, gear and moving part in the plant. So they "team up," pool their knowledge and experience in a united effort to defeat friction.

The Gulf engineer is well fitted to carry on this cooperative work. His entire time is spent in gaining and applying knowledge of oils and greases—to the end that machines may operate more efficiently and economically. He works with the plant operator, recommending the use of lubricants exactly suited to each moving part and suggesting the best methods of application.

Such careful attention to lubrication pays a generous reward in lowered costs for maintenance, and for power. And, better still, the results are further reflected in improved production from all plant machinery.

The Gulf line includes more than 400 quality oils and greases. The combination of this quality line of lubricants and Gulf's engineering counsel can help *you* attain maximum efficiency for every machine in *your* plant.

GULF INDUSTRIAL LUBRICATION

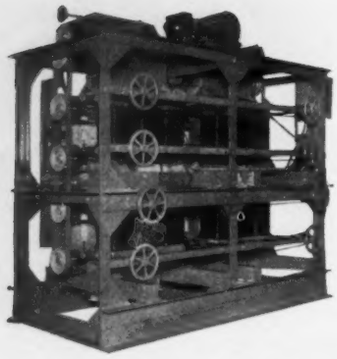


Fig. 6—Gravity induction type magnetic separating unit uses a series of magnets to induce magnetism in the particles and facilitate their removal

over the top of the machine and into a receiving hopper.

The prevalence of reluctant magnetic particles in material to be treated or purified has brought about an extensive use of the so-called gravity induction type magnetic separator, Fig. 7, which utilizes the natural weight of the material and brings it in contact with magnetically induced rolls set in series, the first being what is termed a rougher roll. In the process of cascading through the various magnetic fields highly reluctant particles will receive a charge in the first fields which makes it comparatively easy to extract them in the final magnetic zones.

It is apparent from the foregoing that each type of separator has a variety of applications. Sometimes, it is rather difficult to decide which one is best adapted to the individual conditions to be met. Several types of machines can often be used with varying success for any single application. Protection against damage from tramp iron can sometimes be secured with any one of several different types of machines.

Some one application, however, is usually to be preferred and the engineering advice of the manufacturer should be given consideration. When problems involving the removal of iron impurities arise or when the concentration of ores is under consideration, it is usually highly desirable to have samples analyzed by engineers who are qualified and fully informed. Such service is rendered to responsible parties and without obligation.

Method Developed for Estimation of Cadmium

Volatilization of cadmium from alloys rich in tin can be made so complete without appreciable loss of tin that it has been adopted as a method of analysis.

In technical publication series A, No. 55, of the International Tin Research and Development Council, Prof. D. Hanson and Dr. W. T. Pell-Walpole have described the procedure they developed during their investigations on the constitution of alloys of cadmium and antimony with tin.

The alloy is weighed into porcelain combustion boats which are then maintained at 700 to 730 degrees Cent. for thirty minutes in a silica tube connected to a vacuum pump to assist the volatilization of the cadmium. Several estimates may be made simultaneously. The degree of accuracy was checked and found to be perfectly satisfactory. Copies are available from the council, 104 Broadway, New York.

Timer Aids in Better Welding

THROUGH use of the "Ignitron" spot welding timer, successful spot welding of the non-ferrous group of metals, particularly in dissimilar combinations, is now possible, according to H. Thomasson, welding engineer of Canadian Westinghouse Co., Ltd. Recent tests utilizing the timer's accurate control of current time have shown combinations, such as 18-8 stainless to nickel silver, bronze to mild steel or galvanized iron, brass to bronze or nickel silver and many others, to be a simple matter, while such metals as aluminum, lead and zinc were readily spot welded to themselves.

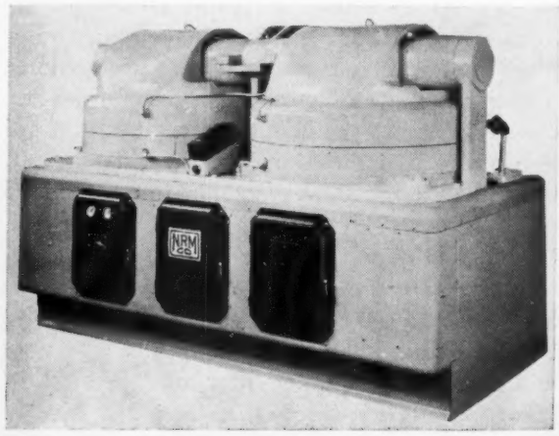
Using "Cupaloy", copper-chromium alloy, as welding point material in a 100 kilovolt ampere, press type welder with 12-inch depth of throat, eleven distinctly different metals in nineteen gages were successfully welded to the same material, as were twelve combinations of dissimilar metals, during a single six hour developmental period with the "Ignitron" control. Point diameter was carefully held to ¼-inch. Current used was 60 cycle with a 440 volt primary, while tip pressures were noted by means of a pressure meter.

Each sample was tested as made and no weld was considered accomplished until the spot produced had first class appearance, free from burrs, feathers, or serious discoloration or indentation, and which, on a test to destruction, pulled a hole in the parent stock at least 3/16-inch in diameter—with the exception of zinc and Everdur. It was found impractical to get a spot in Everdur or ⅛-inch thick zinc that would tear a hole, most likely due to the fact that the thickness made the circumferential cross section around the spot greater than the area of the weld.

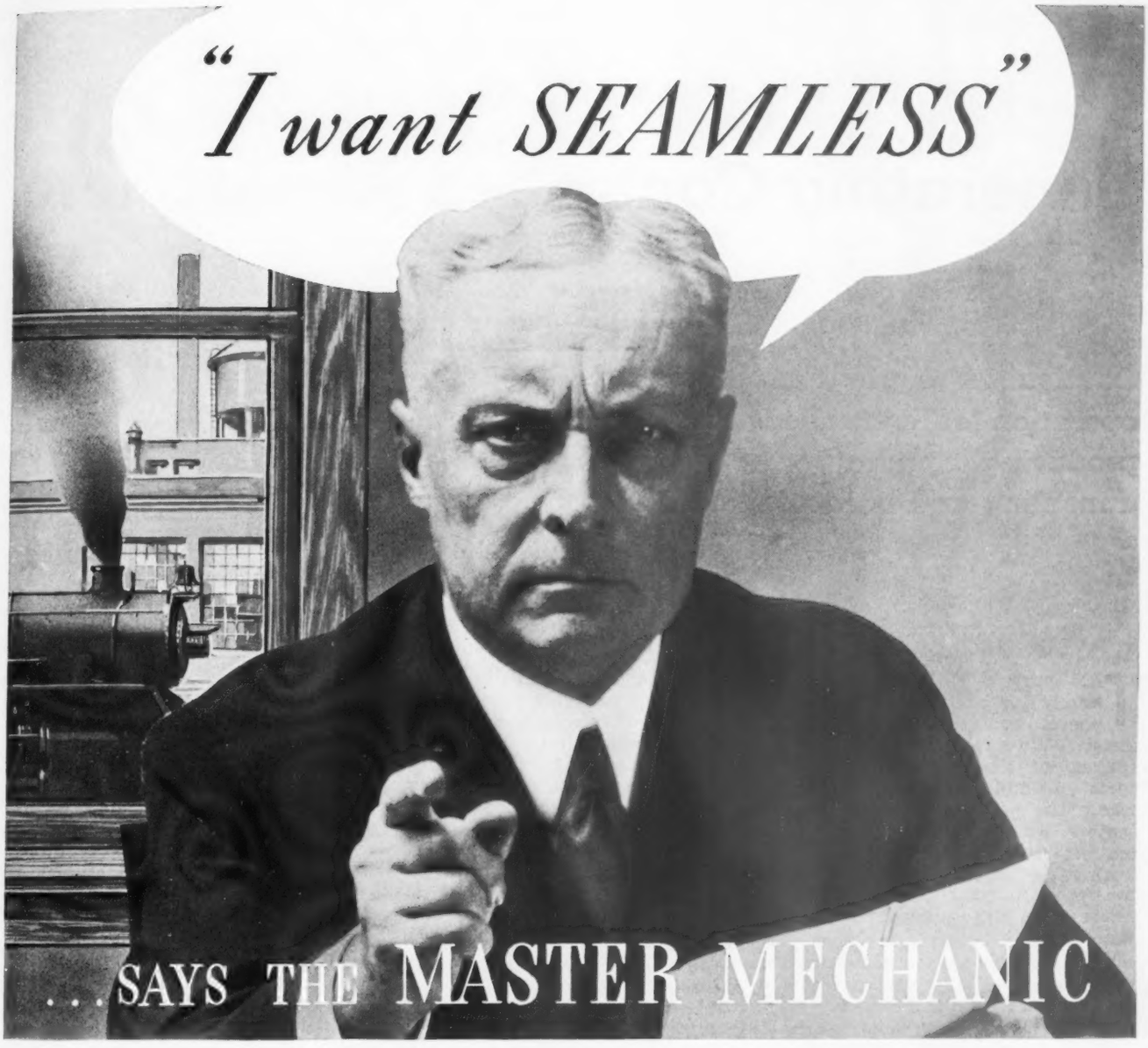
Zinc was the only metal in which the indentation was at all serious, running about 30% of the thickness and no other case exceeded 10 per cent. Following the tests all samples were photographed and results tabulated.

New Machine Vulcanizes Two Tires at One Time

National Rubber Machinery Co., Akron, O., has developed and placed in production a new tire vulcanizing machine in which two tires are treated simultaneously. While it has two separate mold units it is operated by a single motor drive and gear reduction unit. This unit embodies a number of new and novel features, including an improved type toggle mechanism and simplified piping which practically eliminates the use of the conventional type swing joints. The new vulcanizer requires a minimum amount of floor space and its side members are so designed that these dual units may be assembled, side by side into a battery of any desired length. A recent order, placed by Ford Motor Co., Detroit, called for 300 of these dual type vulcanizers as well as 74 single type inner tube vulcanizers.



NEW tire vulcanizing machine has two separate mold units operated by a single drive. Ford Motor Co. recently bought 300 in a single order



In a position to consider every factor—original cost, installation, safety and dependability, length of probable life—the master mechanic will pick SEAMLESS. There's no sentiment about it—just plain common sense backed up by the hard facts of long experience. Aside from the fact that seamless is free from points or zones of potential weakness, the way PITTSBURGH Seamless is made it is bound to be a better tube. It is made of better steel to begin with and the very process itself tends to improve that steel. A completed PITTSBURGH Seamless pipe or tube is a homogeneous piece of steel of uniform strength throughout, treated for greater ease in fitting. Constant inspection-control throughout the process of manufacture, together with thorough final testing, assures the delivery of flawless pipes and tubes from PITTSBURGH STEEL COMPANY mills.

PITTSBURGH STEEL COMPANY · PITTSBURGH, PA.

New York Philadelphia Cleveland Detroit Chicago Memphis Charlotte Tulsa Houston Los Angeles

Large stocks carried by distributors in principal cities

Pittsburgh Seamless

CONDENSER TUBES • HEAT EXCHANGER TUBES
BOILER TUBES • HIGH PRESSURE PIPING

THERE IS NOTHING SUPERIOR TO SEAMLESS

Generating Controlled Atmosphere

Caution is required in design and operation of controlled atmosphere producing apparatus for use with annealing and hardening operations

BY WILLIAM O. OWEN*
Surface Combustion Corp.
Chicago

THE purpose of this paper is briefly to discuss gas atmospheres as applied to ferrous metals. We may readily divide this subject of atmospheres into two parts: 1—direct fuel fired furnaces where the products of combustion come in contact with the work; 2—indirect fired furnaces where the work to be heated is protected from the products of combustion and where specially prepared atmospheres may be used.

In direct fired furnaces atmospheres may be described as reducing or oxidizing. The reducing atmosphere is said to contain combustible gases, whereas the oxidizing atmosphere is made by complete combustion with excess air. At high temperatures, if a reducing atmosphere was to be maintained in a furnace, it formerly was necessary to forget fuel economy and put a great deal of excess fuel into the furnace to maintain the necessary temperatures. Yet at high temperatures the rate of oxidation is rapid; besides, very few plants can totally neglect fuel economy. The practical solution to this difficulty has been the development of equipment for the creation of a carbon atmosphere independent of the heating system of the furnace.

In 1935 the diffusion flame burner was developed. The purpose of this burner was to gain a high rate of heat transfer by flame radiation and at the same time protect the work being heated from oxidation by means of a supplementary gas blanket. Today, after a period when many applications have been made, we can better bracket the diffusion or controlled luminous flame. We know its limitations, its disadvantages and how best to apply it for effecting furnace atmospheres. It, together with a gas blanket, is one form of preparing a furnace atmosphere.

Following the development of the diffusion burner came the smoke or carbon diffusion burner. This type of burner is used not as a heating burner but independent of the heating system. It precipitates free carbon for the furnace atmosphere. The carbon is created by partially cracking the gas air mixture supplied to the smoke burner.

Limits Oxidation

The application of this burner in conjunction with clear flame combustion has done much to limit oxidation and decarburization in direct fuel fired furnaces. One of the most interesting and important applications of the combination clear flame and smoke burners has been in sheet mills, on furnaces used for heating bars and packs for hot rolling. Anybody who has been through a sheet mill, especially when rolling light gage sheet in packs, has seen men with irons hammering away at the packs to get them open after rolling. It formerly was the practice to give the sheets a charcoal dip to prevent this sticking. It was found, however, that the injection of free carbon into the furnace atmosphere not only prevents sticking but also gives good and uniform appearance to the surface of the sheets.

There are many other applications as, for instance, car bottom furnaces where oxidizing and decarburizing effects can be greatly offset. In wire mills where coils are heated to temperatures of around 1900 degrees Fahr., it has been possible to meet the extremely difficult condition of preventing detrimental scale formation on the outer strands of coils. The best results are obtained by using gases that lend themselves readily to carbon precipitation, such as natural gas. The use of the smoke burner in combination with clear flame combustion is the simplest practical and economical way to gain a certain amount of control over furnace atmospheres. In many cases the control thus gained is ample for the customer's needs and improves existing fuel fired furnaces operated at elevated temperatures, where some control of oxidation and decarburization is desired. It is wise that the customer understand, however, the limitations of this equipment and not be pinned down by a guarantee of no decarburization or no oxidation.

In a great many instances, however, particularly in more refined heat treating operations, too many variables such as sulphur, water vapor and carbon dioxide and carbon monoxide, all of which have decided influence on the results obtained, are present. The control of these variables brings us to the definitely controlled atmosphere furnaces. We are all familiar with the

*Abstracted from a paper presented before a national conference on gas sales conducted in Chicago under the auspices of the industrial gas section of the American Gas association and the Midwest Industrial Gas Sales council.

AS NEAR AS YOUR TELEPHONE...

FOR SPEEDY SERVICE, CALL—

New York, N. Y.
Wm. C. Dickey

Pittsburgh, Pa.
McKee-Oliver, Inc.

St. Louis, Mo.
Hubbell & Sharp

San Francisco, Calif.
W. S. Hanford

Boston, Mass.
Edward H. Lloyd

Chicago, Ill.
Theo. L. Dodd & Co.

Houston, Texas
The Corbett Corp.

Los Angeles, Calif.
Ducommun Metals & Supply Co.

Seattle, Washington
W. C. Scott, Jr.

Cleveland, Ohio
E. F. Bond

Detroit, Mich.
H. L. Sevin

Montreal & Toronto, Canada
Drummond, McCall & Co., Ltd.

WORTH

WORTH SERVICE

Prompt, courteous and helpful service on products of accepted standard Quality—yours, when you call in the nearest WORTH representative. He'll follow your order through every step of the way; you can depend upon his every effort. Use him . . . to help you . . . when next you're ordering uniform, fine quality—

SHEARED STEEL PLATE
Up to 150" wide

FLANGED and DISHED HEADS
In large diameters and heavy gauges

BLUE ANNEALED SHEETS
In all gauges down to No. 16 and widths up to 60"

WORTH STEEL COMPANY · CLAYMONT · DEL.

fact that the use of atmospheres for control of surface conditions is not new. Twelve years ago gases such as hydrogen, disassociated ammonia and raw gas conditions by passing through heated iron filings or coke were being used. Results from the use of these gases were not uniform and some of them were dangerous to handle in large quantities.

To bring controlled atmospheres to their present importance in fuel fired furnaces, certain developments were necessary. The first was a means of protecting the work being heated from the contaminating influence of the flue gases. Twelve years ago tight muffles to operate at elevated temperatures in large continuous furnaces were considered impractical. As greater knowledge was obtained of the action of cast alloys under heat and foundry practice was improved, the alloy muffle was found not only to be entirely practical but also economical as attested by hundreds of successful applications.

Muffles Heating Gases

The next important development along this same line was the use of the radiant gas tube which, in effect, muffles the heating gases whereas the ordinary muffle muffles the work. This development consists of heating a tube internally and radiating heat to the work. In our particular construction we keep these tubes under suction so that in event of any leaks the leak will be from the furnace into the tube and the atmosphere of the furnace will thereby be protected. Here again the development of diffusion combustion plays a part. We heat our tubes, which are horizontal, with diffusion flames whose characteristics are low flame temperatures, high radiating qualities and uniform distribution of heat. Other developments were made in furnace construction and means developed through vestibules or eductors to charge furnaces without too much loss of atmosphere. On hardening furnaces means were developed to keep the fumes from the quenching fluid from entering the furnace through the quenching chute.

Hand in hand with the constructional development of furnaces suitable for atmosphere control went the development of atmospheres and means for economically and simply producing them. Let us first examine the results we usually wish to accomplish with controlled furnace atmospheres. These may be divided into four parts: 1—Maintaining a clean surface or a surface without change; 2—reducing oxides already formed to a free metallic state; 3—maintaining the carbon content of metal; 4—adding to the carbon content of the steel.

An examination of the iron carbon equilibrium diagram will show that it is complex and that all reactions are reversible as we progress from one temperature range to another or from one field to another. An absolutely inert gas undoubtedly would accomplish one of the things we wish to do in a controlled atmosphere furnace, that is, maintain clean surfaces. But that is only part of the story. Early in our laboratory experiments we dropped the idea of a totally inert gas but adopted the idea of using gases that would react and then control the reaction. Eutectrol gas carburizing and the menthonol process of clean annealing brass proved that the use of reacting gases was thoroughly practical.

Let us look at gas carburizing for a moment, since this development had a great deal to do with subsequent knowledge and development of atmospheres. Here we have three zones: 1—the carbon deposition zone; 2—the reaction zone in which the carbon so broken down goes through an atomic reaction with a constituent such as CO_2; 3—a diffusion zone where the carbon is diffused through the steel. This is a good example of controlling the reactions of atmosphere gases rather than trying to prevent reactions. One way of carburizing is to deliberately inject CO_2, a decarburizing agent, into a carburizing gas. But the CO_2 reacts in the second zone with the free carbon and by a predetermined flow of gas, accumulations are prevented which might reverse the sequence of reaction.

As more was learned of atmosphere gases and their reactions and uses, study was given to the building of machines in which gases for atmospheres could be manufactured easily and economically. The most common and most universally adaptable machines which use natural gas with a mixture of 6 to 1, give an atmosphere containing 74 N_2, 9.6 H_2, 8.7 CO, 5.8 CO_2 and 1.9 per cent CH_4. This gas will be saturated with water vapor at approximately 135 degrees Fahr.

Equipment for generating this gas consists of an insulation lined, cylindrical, combustion chamber in which a proportioning type of burner supplies the size to one mixture. This is sufficient to maintain temperatures necessary for reaction within the chamber without resorting to external means of heating. Resulting gases are led to a water cooling tower where they are cooled and dropped to nearly tap water temperature. From there they are led to a refrigerator coil which of itself decreases the moisture to any degree desirable. It has been found that where sulphur laden gases are used the sulphur is changed by combustion to H_2S or SO_4 and may be readily removed from the prepared gases by use of iron oxide towers or boxes.

There are certain applications, however, where the DX machine cannot be used; for instance, to protect high carbon steel from decarburization. In this instance it is necessary that a gas be produced which will be in equilibrium with the carbon in the steel being treated. The analysis cited above would be in equilibrium with about 0.40 carbon steel. Where it is necessary to go to a richer gas atmosphere, to increase the ratio of carbon monoxide to carbon dioxide, there is another standard machine available called the C. G. unit or cracked gas unit. Unlike the DX machine whose reactions are exothermic the reaction in the C. G. machine is endothermic. The raw gas in the C. G. machine is passed through tubes and cracked by means of heat externally applied. Still another method for producing rich atmospheres is the charcoal gas machine where a partially combusted gas is passed through towers of heated charcoal. In addition to the processes employed in these standard machines there are many auxiliary methods of reducing the water content in the atmosphere gases

Money Flows Freely In Japan

MELTING pure nickel for coins in the Imperial Japanese mint at Osaka is done in eight high-frequency, induction furnaces of the Ajax-Northrup type, built under license by the Sibaura Engineering Works of Japan

NEED MECHANICAL TUBING?

Reach for your telephone and call for SHELBY

WHEN you are designing machine parts, call the nearest SHELBY Distributor. You'll find him a specialist in tubular construction . . . able to offer valuable suggestions on practical design problems and ready to help you select the right type of tubing for the job.

Selection of the best type of tubing for a particular application is not always a simple task. These men *know* tubing from the inside out. They can draw on stocks of wide assortment — round, square, rectangular, oval, and other sections; numerous sizes, lengths, and wall thicknesses; various finishes and grades of steel. That's why it pays to call in the tubing specialist, your SHELBY Distributor, when designing parts that involve tubular sections. Find out what you can do with SHELBY Seamless Tubing.

Distributors in 23 Key Industrial Centers:

BOSTON, MASS.
Austin-Hastings Co., Inc.
226 Binney Street
Cambridge, Mass.
Phone: Kirkland 4480

BUFFALO, N. Y.
Peter A. Frasse & Co., Inc.
50 Exchange Street
Phone: Washington 2000

CHICAGO, ILL.
C. A. Roberts Co.
20 Aberdeen Street
Phone: Haymarket 6330

CINCINNATI, OHIO
E. K. Morris & Company
311-323 W. Second Street
Phone: Main 1525

CLEVELAND, OHIO
The Strong, Carlisle & Hammond Company
1392 West Third Street
Phone: Main 6760

DETROIT, MICH.
C. A. Roberts Co.
2460 Bellevue Avenue
Phones: Ivanhoe 2020-2021-2022

DENVER, COL.
Hendrie & Bolthoff Manufacturing & Supply Co.
1639 Seventeenth Street
Phone: Keystone 4111

HARTFORD, CONN.
Peter A. Frasse & Co., Inc.
868 Windsor Street
Phone: Hartford 7-4388

INDIANAPOLIS, IND.
C. A. Roberts Co.
207 W. Morris Street
Phone: Drexel 6000

JERSEY CITY, N. J.
Peter A. Frasse & Co., Inc.
12th and Provost Streets
Phone: Delaware 3-4888

LOS ANGELES, CAL.
Ducommun Metals & Supply Co.
219 to 227 Central Avenue
Phone: Trinity 0621

MONTREAL, CANADA
Lyman Tube & Supply Co., Ltd.

NEW ORLEANS, LA.
Standard Supply & Hardware Co., Inc.
822-838 Tchoupitoulas Street
Phone: Raymond 2251

NEW YORK, N. Y.
Peter A. Frasse & Co., Inc.
17 Grand Street
Phone: Walker 5-2200

PHILADELPHIA, PA.
Peter A. Frasse & Co., Inc.
3717 Wissahickon Avenue
Phones: Radcliffe 7100
Park 5541

PITTSBURGH, PA.
Williams & Co., Inc.
901-937 Pennsylvania Avenue
N. S. Pittsburgh, Pa.
Phone: Cedar 8600

PORTLAND, OREGON
Pacific Machinery & Tool Steel Co.
630 S. E. Belmont Street
Phone: East 2148

ROCHESTER, N. Y.
Peter A. Frasse & Co., Inc.
Temple Building
Phone: Stone 4671

SAN FRANCISCO, CAL.
Ducommun Metals & Supply Co.
656 Townsend Street
Phone: Hemlock 7550

SAN FRANCISCO, CAL.
C. W. Marwedel
76 First Street
Phone: Douglas 4180

SEATTLE, WASH.
Cragin & Company
932 First Ave. South
Phone: Elliot 0052

SEATTLE, WASH.
For Sale by:
Seattle Steel Company
1200 Fourth Ave. South
Phone: Seneca 2300

ST. LOUIS, MO.
C. A. Roberts Co.
907 Carr Street
Phones: Chestnut 7070-7071

SYRACUSE, N. Y.
Peter A. Frasse & Co., Inc.
State Tower Building
Phone: 2-1359

TORONTO, CANADA
Lyman Tube & Supply Co., Ltd.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

when desirable such as calcium towers, silica-gel, lithium chloride and activated alumina.

Unlike gas carburizing we sometimes run into an application where for the best results we cannot use a prepared gas and control its reactions, but must control the constituents of the gas through the heating cycle. An outstanding example of this is malleableizing. It is known, for instance, that it is easier to malleableize iron with a relatively high carbon content, say 2½ per cent, than iron with a low carbon content. If, therefore, decarburization takes place on the surface, the iron will not malleableize readily but will retain a certain amount of pearlite. This results in an iron hard to machine.

A malleableizing cycle is composed of five distinct intervals: 1—Heating up period; 2—holding period; 3—rapid cool period to just above control range; 4—slow cool through an interval; 5—more rapid cool to discharge temperature.

Considering the atmosphere, we know that atmosphere of a given composition is in equilibrium with a metal of a definite carbon content only at a more or less definite temperature. If the temperature is varied the same atmosphere will not remain in equilibrium with the metal and decarburization, carburization or oxidation or a combination will result. When iron is heated CO is liberated and becomes part of the furnace atmosphere, this liberation becoming noticeable at 1500 degrees Fahr. and increasing as higher temperatures are reached. In continuous malleableizing furnaces the atmosphere, therefore, becomes a compromise, since the original atmosphere introduced cannot remain in perfect equilibrium throughout the cycle. On a batch type malleableizing furnace we recently installed, the constituency of the gases entering the furnace is changed at will and remains in equilibrium with the work.

Though equipment has been evolved for easily and simply producing atmospheres, and furnaces been developed suitable to the application of prepared atmospheres, the whole subject is still one to be approached with caution. A thorough knowledge of the history of the metal to be treated, its final physical and metallurgical requirements, and the processing it must undergo has an important bearing on the environment, or atmosphere, in which it must be heat treated to get desired results. It is essential thoroughly to investigate and secure the best advice possible in approaching this seemingly innocent problem.

In general, with the present day simplified means of manufacturing prepared gas furnace atmospheres, the better furnace construction now available and the growing realization by manufacturers of the advantages of heat treating metals without surface change, prepared atmosphere furnaces undoubtedly will have an increasingly dominating influence in future heat treating.

Assembling Steel Plate for Welding Is Important Factor in Good Job

BY FOREST MAJOR
Works Manager, Tippett & Wood, Phillipsburg, N. J.

SUCCESSFUL assembly of welded steel plate work of various descriptions depends largely upon careful and proper preparation of the material. Extreme care should be taken when laying out the work to allow proper clearances at the welded joints, so that unnecessary cutting, chipping and grinding are reduced to a minimum. Shearing, planing, torch cutting and the like should also be performed very carefully and accurately in order to save time during assembly.

Steel plate fabricators are continually complaining about the high cost of assembling welded jobs. They are forever trying to devise better and speedier methods of fitting up when most of the difficulty is caused by careless preliminary operations, such as laying out, shearing, torch cutting, planing, bending and shaping. If these operations are accurately performed many valuable hours will be saved in assembling and welding.

Foremen sometimes criticize a man who is assembling a welded job for taking too much time, when in reality the work was laid out incorrectly, as well as carelessly cut and formed.

Design of welded work is of utmost importance and is really the first step toward low cost of fabrication and good work. When the assembly man or fitter-up, as he is usually called, finds it necessary to cut tack welds apart after having assembled part of a job, in order to get other pieces into position, costs mount very rapidly. Sometimes he finds it necessary to torch cut the edges of plates or shapes which cannot be taken out. This always results in high costs and delays as well as inferior workmanship in many cases.

Of course some complicated and heavy steel plate work is more or less difficult and costly to assemble for welding at its best. However this is all the more reason for utmost care to be taken, starting with the design and laying out and followed by careful preparatory operations for assembly.

When starting assembly of welded work, after all parts are properly prepared, extreme care should be taken to keep center lines, openings, bolt holes, flanges and the like in correct position. If some parts are to be welded before complete assembly, which is often necessary, expansion and contraction of welds must also be taken into consideration and proper allowances made.

As a rule butt joints are found to be the most difficult to assemble for welding, but as stated before, if the work is accurately prepared much time will be saved resulting in lower costs and certainly better workmanship.

In cases where it is possible to do so, it is good practice to assemble completely the entire job before starting to weld. There are exceptions to this rule on some classes of work, as there are times when the welding must be done as assembly of the work progresses.

Therefore, most important of all is careful and accurate preparation of the various parts of welded steel plate work of all kinds. The best fitter-up and the best welder cannot possibly do his part of the job in a first class manner unless the work is carefully and accurately prepared. This important phase of the job is often overlooked and neglected.

Markets Sink Unit

Excel Metal Cabinet Co. Inc., Jamestown, N. Y., has placed on the market a new package unit consisting of a welded steel kitchen sink and under-sink cabinet finished in baked enamel in a variety of colors. Features are sound absorbing material in doors and drawer fronts, heavy rubber bumpers on doors and drawers, resilent linoleum top and splash back and quality, cast bronze, chromium plated hardware in combination with black composition material.

WELDING, ETC.

BY ROBERT E. KINKEAD

Need New Welding Ideas

NEW ideas in the welding field appear to be born in periods of economic stress.

Of all the developments in progress with which we are familiar, none is being carried out on ideas that were conceived within the last two years.

Another view of the same situation, and perhaps a more homely one, arises from the readily observed fact that not less than 80 per cent of the men from whom one might expect new ideas in welding to come have taken on anywhere from ten to thirty pounds additional weight. Patents being issued at present relate to details rather than broad conceptions.

The economic significance of this state of affairs may be variously interpreted. In general, during an ascending spiral of prices people can make money without bothering with new ideas. Freedom from financial worry puts weight on most people and their energies are expended where the effort required is less than in the case of dealing with new ideas.

It appears natural and normal, while prices are whirling upward, for people to make the immediate dollar rather than play with ideas whose earning power is in the future and problematical. The ideas that are making money now are those that were conceived before or during the deep valley of the depression when a man had to be smart to live. Such economic significance as may be attached to these conditions arises from the rather obvious fact that prices do not spiral upward forever.

Welding is so far from the end of its development either as to equipment or application that no one can afford to cease for a moment to search for new and better ideas. And it is a fact that a few companies, particularly in the application field are doing just that with promising results in sight.

Of course, if prices are going to continue to go up forever, money spent in this direction will be wasted. On the other hand, if such work is not undertaken and the expenses worked into costs, Messers Roosevelt, Farley, Hopkins and Wallace will get it for various of their schemes which require large sums of money.

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

• • •

Welding on the Whangpoo

A GROUP of welding technicians recently was discussing the possibilities of protecting the populace from aerial bombs. Shanghai needs such protection at the present moment, but London, Paris or Rome may be the next.

The argument ran about as follows: in a small city block 500 feet square, the chance of a direct hit on an area of 70 square feet is about 1 in 3500 for each bomb dropped. The chance of getting killed by falling buildings or flying fragments is probably not less than ten times as great. Thus the main problem seems to be one of secondary effects rather than direct hits.

A steel hut to protect ten people for the short duration of the air raids against everything but a direct hit could be built by any tank shop at a cost of not to exceed $200, or $20 per capita.

Assuming that one fourth the population would find refuge in cellars or be operating the defense mechanism, out of a million souls, 750,000 would have to be taken care of in the steel huts. This would cost about $15,000,000. The figure does not seem excessive as expenditures for fighting units go and might even be justified by the most practical strategist on the grounds of increased morale of the non-combatant population.

The hut proposed was simply a semi-cylindrical shell, 7 feet long and 10 feet in diameter, of ½-inch thick steel plate with partly closed ends and bracing to resist crushing from falling walls and other heavy objects.

One ingenious welder suggested that the same structure could be turned upside down and used as a life boat for flood emergencies.

About 30 man hours would be required to cut, form and weld the steel huts. The fabricators of eastern Ohio and western Pennsylvania could easily turn out 5000 of such huts per day with existing equipment. This would require 10,000 tons of steel per day. If it is necessary to provide huts for only 750,000 people out of a million, this fabricating capacity could build the protection for a million people every fifteen days.

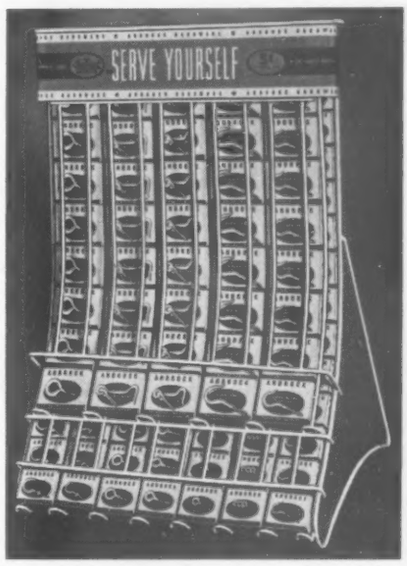
Markets Shin Guard

Marketed as an attachment to the Sankey foot guard, an aluminum alloy shin guard is being manufactured by Ellwood Safety Appliance Co., Ellwood City, Pa.

As a unit, the guard furnishes foot and leg protection against hazards such as found in foundry operations and manufacturing process requiring protection of this kind. The complete guard is easily put on without special adjustment, and is said to be comfortable while still permitting free foot and leg action on the part of the wearer.

• • •

Products in Packages

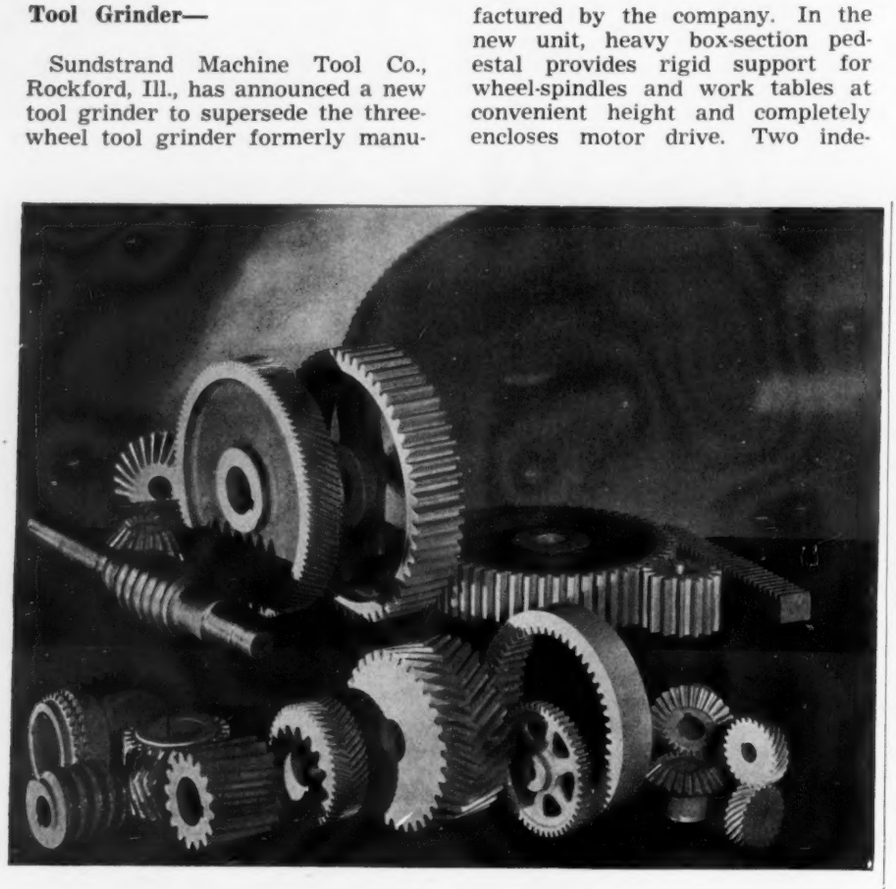


BRIGHT wire goods such as screw eyes and hooks, cup hooks and the like are now being offered in package form instead of in bulk as formerly, by the Washburn Co., Worcester, Mass. A self vending counter display has been prepared, also from wire, to make these new packages readily available to the customer

NEW EQUIPMENT

Tool Grinder—

Sundstrand Machine Tool Co., Rockford, Ill., has announced a new tool grinder to supersede the three-wheel tool grinder formerly manufactured by the company. In the new unit, heavy box-section pedestal provides rigid support for wheel-spindles and work tables at convenient height and completely encloses motor drive. Two independent heavy spindles of heat treated chrome-nickel steel are mounted on the same center-line and run in precision, anti-friction bearings protected by oil seals. A well-ventilated, readily accessible compartment in the base houses the driving motor which has standard NEMA frame and is securely mounted on an adjustable bracket close to the floor line. V-belts provide smooth flow of power to spindles and dampen vibration. A conveniently located switch starts, stops and reverses driving motor. This enables operator to do all grinding with wheel running toward the cutting edge of either right hand or left hand tools, thus



Grinding on the new Sundstrand tool grinder is accomplished by oscillating carriage, table and tool as a unit

tending to increase smoothness and durability of the edges. Rough grinding wheel with steel back is mounted on spindle pilot, and adjustable steel guard provides for 2¾ inches wheel wear. Three-way valve and double nozzle flood either side of grinding wheel as required. Rough grinding table has trunnions in well protected bearings to allow adjustments ranging from 10 degrees above horizontal to 30 degrees below. Position of table is indicated clearly on the direct reading scale, adjustment being made quickly and solidly clamped by one movement. An accurately machined T-slot provides means for clamping tools in adjusted position. Carriage supporting rough grinding table forms a catch basin for coolant and abrasive and is mounted for oscillation and infeed on heavy steel bar.

• • •

Automatic Press—

Toledo Machine & Tool Co., Toledo, O., recently adapted the press

"HARD-DUR" STEEL GEARS
preserve the tooth form . . .

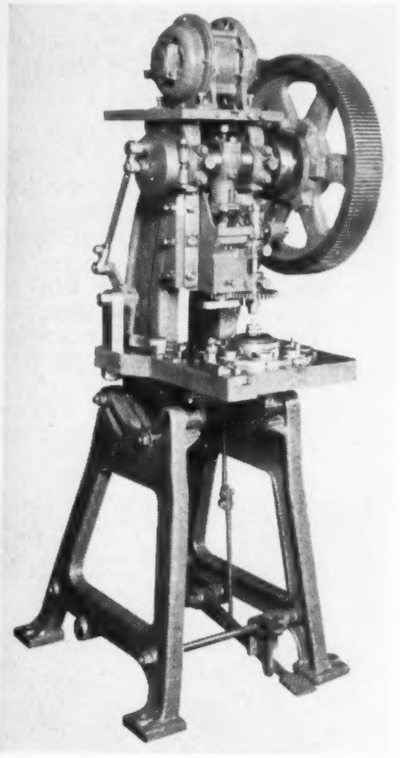
● When gears are in operation, tooth pressure tends to destroy the involute curve and as this wear progresses the gears no longer run efficiently.

Horsburgh & Scott "HARD-DUR" gears not only have involute teeth that are produced to very high standards of accuracy by very careful and painstaking workmanship, but the material is highly wear resistant. In fact, "HARD-DUR" gears possess strength, hardness and wearing qualities so much greater than similar untreated gears that they are guaranteed to have four to five times the life at a cost of only about 50% extra. Their economy is quite apparent.

A 448 page Gear Book is yours for the asking.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

illustrated for a special piece of work requiring an eight-station dial feed for etching with acid the trade mark and number on hardened steel parts. Attached to the slide is a rubber stamp die which is rotated 180 degrees with every stroke of the press. The back stamp die comes down, touching a pan of acid. On the next stroke it rotates 180 degrees to the front and applies it to the work which has been placed under the die by the dial feed. At the same time that the die with the acid has rotated to the front, the die that was in the front rotates 180 degrees to the rear to pick up more acid for the next impression. Thus, a piece is etched for every stroke of the press and, continuing around in the dial, is dropped through a hole in the bolster to a container. The press itself is a Toledo No. ¾, open back, inclinable with a 1½-inch stroke, 6-inch shut height on the bed, and a 1-inch bolster. A ½-horsepower motor of 900 revolutions per minute is geared directly to the flywheel supplying the motive power.



Toledo automatic press is adapted to etching with acid on hardened steel parts

♦ ♦ ♦

Level Transit—

David White Co., 315 West Court street, Milwaukee, is manufacturing a level-transit adaptable for use in steel plants and foundries for aligning machinery and general maintenance work. The instrument comprises a telescope 12 inches long with an erecting lens system of 25 power magnification and 1¼-inch object glass, extra long unobstructed spirit level to telescope, and equipped with cross-hairs adjusted by spiral eyepiece. Sandards are of steel-like bell metal, cast integral with standard base. It has improved bearings for telescope in transit position and spirit level is on standard plate. Horizontal circle is silvered, 4¼-inch, divided to degrees numbered from 0 to 90 in quadrants and vernier to 5 minutes. Vertical arc is of 3-inch diameter, reading to degrees. Leveling head is extra heavy with shifting center and trivit style leveling plate. Equipment includes hardwood carrying case, tripod, sun shade, adjusting pins, plumb bob, and other items. Weight of the instrument is 11 pounds and of tripod 9 pounds.

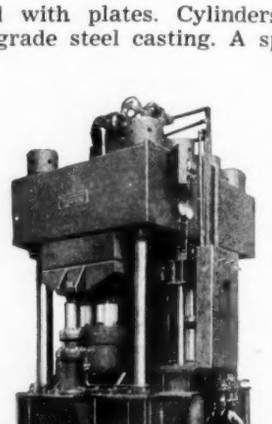
♦ ♦ ♦

Hydraulic Press—

A. B. Farquhar Co., York, Pa., is manufacturing a new hydraulic press designed for economical production of articles involving expensive material and which require uniform thickness of the finished prod-

MORE PIECES PER HOUR . . .
MORE HOURS PER GRIND . . .
That's typical
WYCKOFF
COLD DRAWN STEEL PERFORMANCE
IN ALL AUTOMATIC
SCREW MACHINE PRODUCTION
Modern, high-speed automatic screw machines fairly "sing" with production when fast cutting Wyckoff Cold Drawn bar stock is used. This clean-cutting steel permits higher spindle speeds at no sacrifice in quality or accuracy . . . gives the desired shape with the minimum of machining and waste . . . assures smooth surfaces, sharp corners and clean, perfectly cut threads at all times.
For 100 per cent satisfaction in production, in quality and economy, specify Wyckoff for your automatic screw machine stock.
WYCKOFF
DRAWN STEEL COMPANY
GENERAL OFFICES:
First National Bank Bldg., Pittsburgh, Penna.
MILLS at Ambridge, Penna. and Chicago, Illinois.
Manufacturers of . . . Carbon and Alloy Steels . . .
Turned and Polished Shafting . . . Turned and
Ground Shafting . . . Wide Flats up to 12" x 2".
Warehouse stocks carried by nationally known
distributors

uct. The machine is of heavy construction to minimize deflection, and, for economy, comprises a small motor and pump. The press can be quickly closed by means of the two side rams exerting a low, or presetting, pressure on the material. At the same time the main cylinders are pre-filled from overhead tank by gravity. After pre-setting pressure, the main pressure is applied by means of pilot control valve to the rams, giving approximately 2000 tons, then the pressure is further increased by means of intensifier up to 4000 tons. Operation of the intensifier is entirely independent, but it is actuated from the same power source, and the length of the stroke under the high or intensified pressure in the press could be indefinite without any disturbance of the pressure already applied. Platens are 51 x 132 inches, and there is a 14-inch opening. The two main rams are of 36-inch diameter. The two double-acting side rams are used for quick closing and return. Maximum working pressure of the pumping unit is 2000 pounds, maximum unit of intensified pressure is 4000 pounds, and maximum deflection of the press is 0.005 inch. Top and bottom members of the press are of welded construction made of heavy structural shapes and suitably reinforced with plates. Cylinders are high grade steel casting. A special Farquhar semi-steel mixture is used for the rams which are ground and polished to prolong the life of packing. The control of the machine is by four-pilot four-way operating valves.

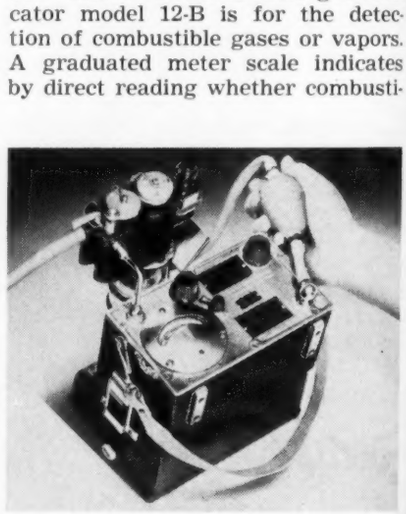


Farquhar press is of heavy construction to minimize deflection

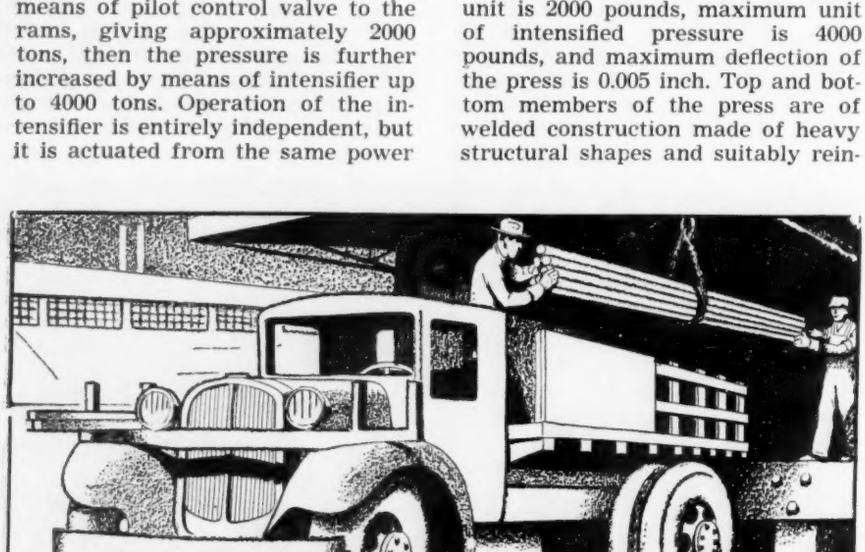
• • •

Gas Indicators—

Linde Air Products Co., New York, has announced a new line of gas indicators, developed for quickly and easily detecting explosive or irrespirable gas-air mixtures. UCC gas indicators are available in three models. The UCC combustible gas indicator model 12-B is for the detection of combustible gases or vapors. A graduated meter scale indicates by direct reading whether combustible gases are present, and, if they are, whether concentrations are above, within, or below explosive limits. For increasing the utility of this instrument, a flame-type safety lamp attachment is available which makes it additionally possible to detect oxygen deficiencies. The UCC All-Service indicator model B-1 com-



UCC All-Service indicator detects explosive or irrespirable air-gas mixtures



Emergency Service—

COLD drawn steel requirements cannot always be anticipated. Occasionally there are *rush* orders. Warehouse stocks of regular cold drawn steels in standard sizes and shapes are carried in all important manufacturing centers. Emergency service—rush order service—is at your elbow—The Telephone.

Moltrup Steel Products Co.
Beaver Falls, Pa.
(Pittsburgh District)
New York • Chicago • Philadelphia • Cleveland • Boston • Houston • Detroit
Erie • San Francisco • Atlanta • Norfolk • Seattle • Pittsburgh • Buffalo • Dayton

bines three units in one. It shows the presence of combustible gases, indicates an oxygen deficiency, and, in addition, includes a toxic chamber for determining the presence of carbon monoxide and hydrogen sulphide in dangerously toxic concentrations. Both the combustible gas indicator and the All-Service gas indicator are equipped with a patented and exclusive air dilution valve. By means of this valve, incoming samples can be diluted with any volume of air, thus making it possible to detect flammable conditions which might not otherwise be indicated due to a lack of oxygen. It also permits following a complete purging operation from start to purge-end point with the use of inert gas as a purging medium.

♦ ♦ ♦

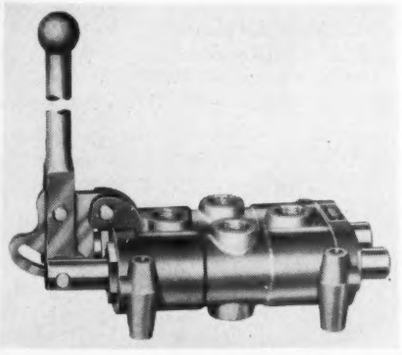
Salt Dispenser—

Mine Safety Appliances Co., Pittsburgh, is manufacturing a salt tablet dispenser that holds 250 salt tablets for prevention of heat sickness in steel mills, foundries and other plants. The dispenser is of simple, waterproof and durable construction. It is equipped with a positive feeding device and dispenses one tablet at a time directly into the palm of the hand which turns the knob. Suitable for outdoor locations, the dispenser is of molded bakelite, with chromium finished metal parts.

♦ ♦ ♦

Hydraulic Valve—

C. B. Hunt & Son's Co., Salem, O., is manufacturing a new hydraulic valve embodying a no-metal-to-metal wear principle and minimum of moving parts. The valves are made for two, three and four-way operation and come in ½, ¾ and 1-inch sizes, two styles, for 1000 and 2000 pounds working pressures. Drop forged bronze housings are said to afford an additional factor for long life with water or corrosive fluids. Valve operation is accomplished in the two-way valve by only one moving part and in the three-way and four-way by coincident motion of valve bodies or plungers made of stainless steel and free-floating in special packings. Balanced port action in conjunction with the valving ring and the no-metal-to-metal contact is claimed to provide a combination for long life and satisfactory performance in hard service. Short travel is an aid to easy operation. Replacements of parts can be made in a few minutes without disturbing the hydraulic piping. Connections are provided so that piping may be permanently connected above or below the housing.



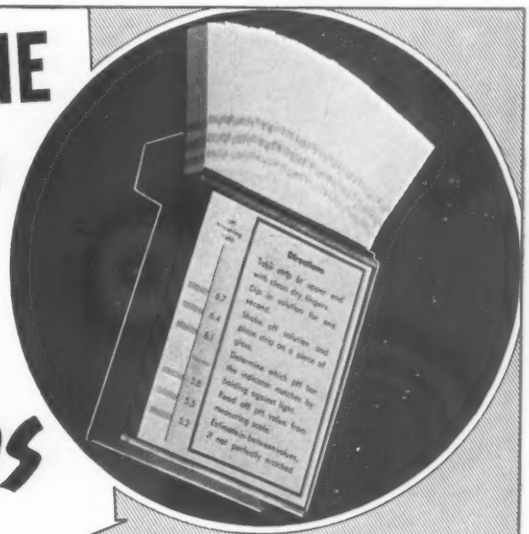
Hunt hydraulic valves embody a no-metal-to-metal contact construction

♦ ♦ ♦

Vertical Coolant Pump—

Pioneer Engineering & Manufacturing Co., 31 Melbourne avenue, Detroit, has brought out a new pump, the model VB, for use in handling coolant or lubricant for machine tools. It is a compact, self-contained unit that bolts directly to the side of the machine base or coolant reservoir. No suction piping is required and intake is directly through the base bracket. General construction

DETERMINE pH in 5 SECONDS with UDYLITE pH PAPERS



Udylite pH papers enable you to determine pH quickly . . . easily . . . accurately, right at the tank at any time. Only a few seconds are required for a pH result as accurate as that obtained with the quinhydrone equipment.

Packed neatly in boxes of 200 strips, the papers may be carried in the pocket or kept in any handy spot. Udylite pH papers are available in seven pH ranges from pH 0.9 (strongly acid) to pH 13.5 (strongly alkaline).

Write for your copy of descriptive bulletin which gives detailed information.

ANYONE CAN DETERMINE pH IN 5 SECONDS! HERE'S HOW IT IS DONE

First select a test paper of the desired pH range. In this illustration, the pH paper selected is for white nickel solution with pH between 5.2 and 6.7.

Dip the paper well into the solution so that all color bands are immersed. A quick dip of about one second is all that is necessary.

Remove, shake off excess solution and hold up to the light to compare. Beginners may obtain better results by placing the wet paper on a glass plate.

THE UDYLITE COMPANY
1651 E. Grand Blvd., Detroit, Mich.

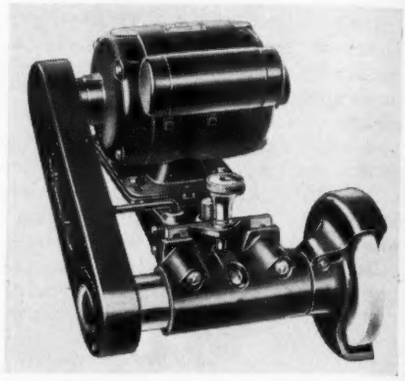
New York 30 E. 42nd Street | Chicago 1943 Walnut Street | Cleveland 3756 Carnegie Ave. | San Francisco 114 Sansome Street

and installation makes the whole unit readily accessible, easily installed or removed. Unit may be dismounted by simply removing the set of flange bolts. The pump is mounted directly on the end of the motor and there is no long shaft to whip, vibrate, or cause trouble. It is a close-coupled unit said to maintain high initial efficiency for an unusually long service period. Liquid handled by this pump does not necessarily have to have lubricating properties, as any type liquid not too highly corrosive or viscous may be pumped. Added advantage of the unit is that no relief or by-pass valves are needed in the delivery line and any degree of throttling may be accomplished without increasing the load on the motor.

• • •

Lathe Grinder—

Dumore Co., Racine, Wis., has brought out a new lathe grinder, its No. 12 model known as "The Chief." The new unit develops one horsepower and maintains precision tolerances on heavy production work. Motor is capacitor type, checked and dynamically balanced to eliminate vibration and chatter marks in grinding. Grease-packed, split-tolerance ball bearings are used and the motor is fully enclosed to prevent dust and dirt from reaching the bearings, rotor and stator. Power from the motor is transmitted to the quill by two No. 1 section V-belts; proper tension is secured by simply sliding the motor on the base and tightening four cap screws. Six sheaves are furnished so that spindle speeds of 2800 to 8200 revolutions per minute are available for delivering correct wheel speeds for wheels 3 to 8 inches diameter. Proper alignment of motor and quill sheaves is assured by a slot in the motor frame and dowel in the motor base.

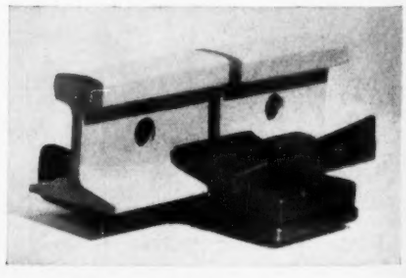


Dumore lathe grinder develops one horsepower and maintains precision tolerances on heavy production work

• • •

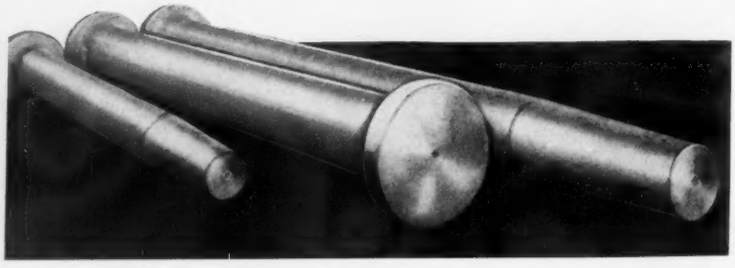
Rail Splicer—

Portable Lamp & Equipment Co., Pittsburgh, is manufacturing a new rail splicer of malleable iron for use in joining temporary tracks laid in mines, quarries, or industrial plant or brick yards. The splicer is resistant to corrosion and shock and is cast with smooth surfaces true to pattern. No fish plates, bolts or nuts are used. Special design facilitates speedy application of the splicer which is made in three parts—main section, wedge, and wedge plate. The main section fits under and flush against the inside of the rails being joined. Two lugs on this part engage the rail holes.



Malleable iron rail splicer is used for joining temporary tracks laid in mines or industrial plant yards

Specify "STANDARD" for Quality



Ship Tail and line Shafts

Dependable quality is seldom fresh born. It nearly always goes back to the painstaking research by a company striving for perfection and to the knowledge that is gained from the experience of mistakes and victories.

Back of us are many years of research, engineering and experience that have resulted in a continued advancement in the quality of "Standard" products. We solicit your use of the facilities offered by this company.

CASTINGS • FORGINGS • WELDLESS RINGS
WROUGHT STEEL WHEELS

BRAND

STANDARD Steel Works COMPANY

BURNHAM, MIFFLIN CO., PENNA.
District Offices
New York Philadelphia Chicago San Francisco
Portland, O. St. Louis

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Monel—International Nickel Co., 67 Wall street, New York, has issued the third number of the first volume of Mechanical Topics, a bulletin for metal users, fabricators and designers.

Lacquer—Roxalin Flexible Lacquer Co., Elizabeth, N. J., is mailing two product summaries, one dealing with tarnish-proof lacquer No. 4527 and the other with outdoor lacquer No. 4917.

Construction—Dresser Co., 1080 The Arcade, Cleveland, is distributing a catalog dealing with Dresser service in building and construction work and picturing a number of its building, plant, station and other constructions.

Foundry Equipment — Foundry Services Inc., 107 East Forty-first street, New York, is mailing a folder briefly describing a long line of foundry equipment and including a card on which to request a working sample of any item.

Transmissions—Lewellen Mfg. Co., Columbus, Ind., has issued catalog No. 35 dealing with Lewellen variable speed transmissions and speed controlling devices and including many installation photos, dimension tables and other data.

Generators — Crocker - Wheeler Electric Mfg. Co., Ampere, N. J., has issued two bulletins on generators, each well-illustrated and descriptive. Bulletin No. 249 covers direct-current generators and No. 247 covers alternating-current generators.

Wire Rope Fasteners—American Hoist & Derrick Co., St. Paul, Minn., is releasing catalog No. CCB-2 covering the Crosby wire rope clip and dealing with the importance of dependable wire rope fastenings. Also released is catalog SNP-1 covering American snow plows and wings.

Rubber Springs—United States Rubber Products Inc., 1790 Broadway, New York, has reprinted in booklet form, "Rubber Springs," a paper on design calculations and representative uses presented at the annual meeting of the American Society of Mechanical Engineers.

Bearings—Norma-Hoffmann Bearings Corp., Stamford, Conn., has issued catalog No. F-958 describing its complete line of precision ball, roller and thrust bearings. With 84 pages, the book includes tabulated data on sizes, dimensions and load ratings in addition to other bearing information.

Welding—Eisler Engineering Co., 740 South Thirteenth street, Newark, N. J., has issued catalog 38W, a 100-page publication dealing with electric spot and butt welding, and containing numerous sketches, drawings, specifications, descriptions and over 1250 illustrations, as well as being a complete catalog dealing with welder tips.

TRAILER AXLES
COMPLETE IN ONE DIE
Your Tough Forging Jobs . . .
Come Easier On Erie Hammers
35 years of specialized experience in hammer building, is concentrated in the Erie. Your requirement is the basis for Erie specifications. The result . . . hammers built to FIT YOUR FORGING WORK . . . For example, this 10,000 lb. Erie Steam hammer which is turning out trailer axles . . . And doing this job COMPLETE IN ONE DIE . . . You can understand why Transue & Williams prefer Eries when you know how rugged strength . . . the guts to stand the gaff . . . are combined in Erie hammers with plenty of speed and control for volume production. 500 forgeshop managers can place their toughest requirements on Erie, confident of profitable results.
ERIE
ERIE FOUNDRY COMPANY
ERIE, PENNSYLVANIA, U.S.A.
DETROIT 335 Curtis Bldg.
CHICAGO 549 Washington Blvd.
INDIANAPOLIS 335 Postal Station Bldg.
FRANCE Fenwick, S. A.
CANADA John Bertram & Sons Co. Ltd.
ENGLAND Burton, Griffiths & Co. Ltd.

MATERIALS HANDLING

Special Facilities Used In Furniture Manufacture

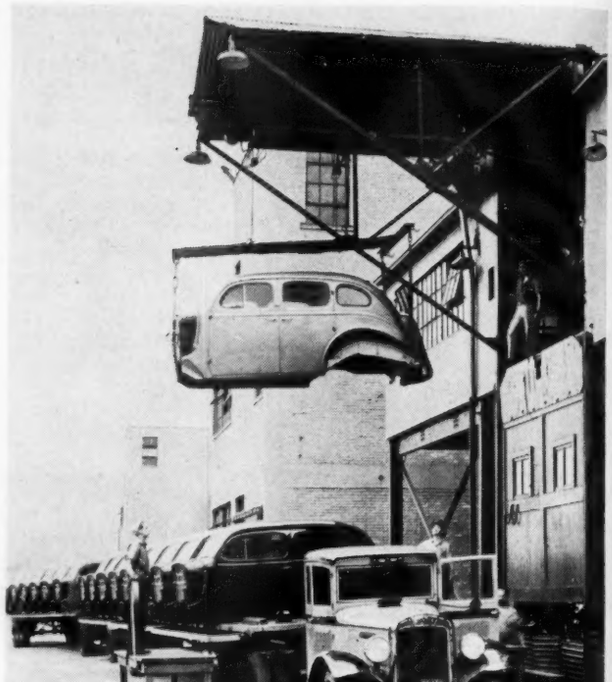
(*Concluded from Page* 46)

comes cleaning and degreasing on an automatic conveyorized cleaning machine. The conveyor, of the overhead chain type, starts at floor level, circles and rises to the entryway, drops down through the tanks and then up through the exit chamber, returning from there to the starting point.

Space Is Conserved

Following the cleaning operation, parts are taken to the finishing conveyor. At this point begin two parallel conveyors, one of which carries cabinets while the other carries the corresponding drawers. Passing first through the spray booths, parts are given the first coat of enamel. They then circle up through the baking ovens which are overhead in a manner similar to the ones in the metal furniture department, previously described. Through the ovens, conveyors travel in the direction opposite to that traveled through the spray booths, which brings the cabinets and drawers down at a point near where they were first hooked on to the conveyor. This setup conserves space and enables the workers to perform several operations in close proximity.

When the parts reach the floor level, they are inspected and sanded preparatory to receiving the second coat of enamel. Still running parallel, the two conveyors pass through a second pair of spray booths where the second coat is applied and so on. Conveyor speed is timed to give the correct span of time while the parts are in the baking ovens. Following subsequent trips through the ovens, all parts are inspected carefully and transferred from the hook conveyors to belt conveyors for assembly. These conveyors also run parallel until the drawer assembly is complete and the drawers are inserted in the cabinets. Finished cabinets then pass along a power roller conveyor to the crating department where they are boxed and sent down an elevator to the shipping dock directly below.



SPECIAL handling equipment for automobile bodies is essential if production schedules are to be met. A common sight on Detroit highways are the extra-long trailers shown in this illustration for interplant movement of bodies. Often as many as 12 bodies are carried crosswise on this equipment. When De Soto bodies reach the assembly plant, power hoists with slings lift them from the trucks to the balcony body hardware line where electrical connections are installed before an elevator or "body drop" lowers them to the final assembly line

"HERCULES" RED-STRAND REG. U. S. PAT. OFF. WIRE ROPE

Furnished in Flattened Strand, Round Strand, Preformed, Steel Clad and Non-Rotating constructions.

A GIANT in Strength and Endurance

MADE ONLY BY

A. Leschen & Sons Rope Co.

ESTABLISHED 1857

5909 KENNERLY AVENUE

ST. LOUIS, MO.

NEW YORK
CHICAGO
DENVER
SAN FRANCISCO
PORTLAND
SEATTLE

Wire Reinforced Hose Said To Be Burst-proof

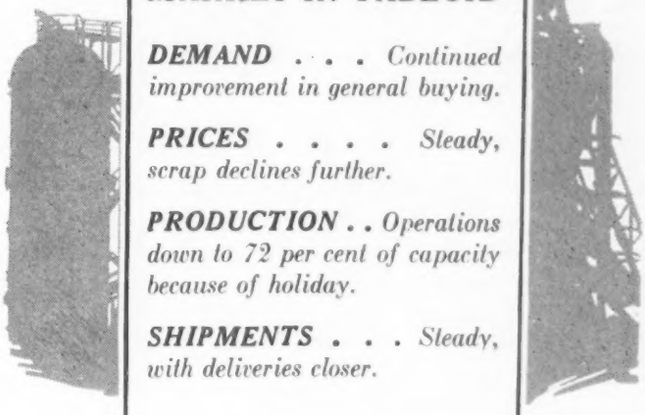
A new industrial safeguard in the form of Burst-Proof steam hose has been announced by B. F. Goodrich Co., Akron, O.

When this hose fails, it will leak, but nothing short of an external blow severe enough to cut the wire reinforcement could cause it to burst, it is claimed. The manufacturers recommend it for 200 pounds working pressure in all sizes, with a safety factor of 15 to 1 in larger diameters and up to 35 to 1 in small diameters.

Tube and insulating layers of the hose are made of a special heat-resisting rubber compound and reinforcement is by braided, high tensile steel wire. Immediately under the cover is an additional layer of strong asbestos cord. Cover itself is of heavy, long-wearing black rubber. The hose is available in sizes ranging from ⅜ to 2½ inches diameter.

Fall Buying Starts Slowly; Backlogs Reduced

Ingot Output High; Europe Buys Scrap; Holiday Cuts Rate



MARKET IN TABLOID

DEMAND . . . *Continued improvement in general buying.*

PRICES . . . . *Steady, scrap declines further.*

PRODUCTION . . *Operations down to 72 per cent of capacity because of holiday.*

SHIPMENTS . . . *Steady, with deliveries closer.*

CROSS currents are evident in the steel market and evidence accumulates that the expected revival after seasonal summer slackness is likely to be delayed until late this month.

European and Oriental threats of war have an unsettling effect and the political situation as it touches industry is none too reassuring. Buying in heavier steel products is definitely light, railroads deferring decisions until rates and wages have been settled. Building is slack and approaching colder weather. The expected outpouring of specifications for automotive use is somewhat delayed, though some business for this purpose is being placed. On the other hand some increase in buying is noted, especially in sheets and bars, largely attributable to auto requirements.

Producers are far from being hard pressed to continue operations at a satisfactory rate. In sheets backlogs are still extensive, deliveries in some cases being as far deferred as ten weeks, though other mills can do better. Tin plate demands are strong and production is at a capacity level. Demand for semi-finished steel is lively and wire products are increasly active.

Steel production was reduced last week by the Labor day shutdown of various producers, the rate for the week being 72 per cent. However, operations were resumed to an extent that carried the rate to about 78 per cent for the latter part of the period. For the week operations at Pittsburgh declined 14 points to 69 per cent, Chicago 13 points to 73, Eastern Pennsylvania 0.5 point to 64.5, Youngstown 8 to 65, Cleveland 16 to 62, Buffalo 7 to 79, New England 5 to 65 and Wheeling 15 to 76. Detroit gained 5 points to 100 per cent. Rates were unchanged at Birmingham, 91, Cincinnati, 89, and St. Louis, 77.

Conclusion of negotiations by the European scrap cartel for about 250,000 tons of steelmaking scrap for export at about $2 above the price contracted in June has caused little disturbance in the market. Some opinion exists that this is an extension of the June purchase, on better terms. As a matter of fact, brokers buying for export in eastern centers have reduced their offering prices the past few days.

Intensity of steel production is reflected in figures for August with output of 4,861,879 gross tons of steel ingots, 6.7 per cent greater than in July and approaching the alltime record of 4,939,086 tons in August, 1929. Production in eight months totaled 38,183,018 tons, which is only 1.65 per cent less than eight months production in 1929, at 38,825,843 tons. August total is 16 per cent greater than for the same month a year ago.

For the first time in 20 years iron and steel exports, excluding scrap, in July approached the monthly average of shipments during 1917. These exports in July were 461,391 gross tons, 50.6 per cent higher than in July, 1936. Pig iron was the largest item exported, except scrap, totaling 168,538 tons, largest for this year. Scrap exports were 428,047 tons, slightly under those of June. For seven months scrap exports have been 2,600,707 tons, the highest level ever attained, more than double the like period of 1936. In the same period 474,389 tons of pig iron were exported.

Automobile producers made only a slight drop last week, completing 59,017 units, compared with 64,200 the previous week. Chrysler made the heaviest drop, from 5800 to 2100, General Motors from 26,600 to 23,096. Ford remained steadily at 26,000 and the other producers made a gain from 5800 to 7821. Some of the latter are in production on new models.

Although shipments of finished steel by the United States Steel Corp. in August, at 1,107,858 tons, fell below those of July they were well above August last year and the best for that month since 1929. For eight months the total is 9,908,884 tons, compared with 6,905,904 for the same months in 1936.

Declining scrap prices in practically all important consuming centers brought a drop of 42 cents in the composite for steelmaking scrap, to $19.33. This is practically the level of the last two weeks in July, all the gains of August being wiped out. The same factor caused a decline of 6 cents in the iron and steel composite, to $40.21. The finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Sept. 11	Sept. 4	Aug. 28	One Month Ago Aug., 1937	Three Months Ago June, 1937	One Year Ago Sept., 1936	Five Years Ago Sept., 1932
Iron and Steel	$40.21	$40.27	$40.36	$40.34	$39.82	$34.15	$28.93
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.10	47.50
Steelworks Scrap ..	19.33	19.75	20.50	20.41	17.15	16.18	7.04

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 11, 1937	Aug. 1937	June 1937	Sept. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	1.95c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.26
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.50
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40
Tin plate, per base box, Pitts.	$5.35	5.35	5.35	5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	1.95

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$30.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	30.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	30.00
Wire rods, No. 5 to ⅜-inch, Pitts.	47.00	47.00	47.00	38.00

Pig Iron

	Sept. 11, 1937	Aug. 1937	June 1937	Sept. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$20.8132
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East Pa.	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
No. 2 X eastern, del. Phila.	26.135	26.135	25.26	21.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.50
Lake Sup., Charcoal, del. Chicago	30.04	30.04	30.04	25.2528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	$20.75	$21.85	$18.40	$17.75
Heavy melt. steel, No. 2 East Pa.	16.75	18.00	15.25	14.00
Heavy melting steel, Chicago	18.25	19.75	16.00	16.15
Rail for rolling, Chicago	20.25	21.75	19.50	16.75
Railroad, steel specialties, Chicago	21.75	22.25	19.50	17.65

Coke

Connellsville, furnace ovens	$4.45	$4.50	$4.65	$3.90
Connellsville, foundry, ovens	5.25	5.30	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, del.	3.84c
New York, del.	3.88c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke, (base box), Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.60c
Gulf ports	2.65c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young.	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$74.00
Single loop bale ties, (base column, c. l.)	63.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	2.95c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring 0.15
6100 bars 1.20
6100 spring 0.85
Cr. N., Van 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot rolled, 25-1ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/8-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to 1-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
1/2-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	59⅛	49
¼	62⅛	53
1—3	64⅛	55⅛

Iron

¼	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¼	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	.....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2½" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00
Class A Pipe $3 over Class B	
Stnd. fitgs., Birm., base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Bham.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 5/16-inch incl.	47.00
Do., over 5/16 to 41/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.35- 4.55
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.25
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	14.75c
do. (450 lbs.)	14.00c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$28.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	nom.
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper, Electro, del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York, Spot	Straits Tin, New York, Futures	Lead, New York	Lead, East St. L.	Zinc, St. L.	Aluminum 99%	Antimony, American Spot, N. Y.	Nickel Cathodes
Sept. 4	14.00	14.12½	13.75	58.62½	58.25	6.50	6.35	7.25	20.00	15.75	35.00
Sept. 6—Holiday											
Sept. 7	14.00	14.12½	13.75	58.50	58.12½	6.50	6.35	7.25	20.00	15.75	35.00
Sept. 8	14.00	14.12½	13.75	58.75	58.25	6.50	6.35	7.25	20.00	15.75	35.00
Sept. 9	14.00	14.12½	13.75	59.25	58.75	6.50	6.35	7.25	20.00	15.75	35.00
Sept. 10	14.00	14.12½	13.75	59.50	58.87½	6.50	6.35	7.25	20.00	15.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper

Sheets

Yellow brass (high)	19.75
Copper, hot rolled	21.87½
Lead, cut to jobbers	10.00
Zinc, 100-lb. base	12.25

Tubes

High yellow brass	22.50
Seamless copper	22.62½

Rods

High yellow brass	16.25
Copper, hot rolled	18.62½

Anodes

Copper, untrimmed	19.12½

Wire

Yellow brass (high)	20.00

OLD METALS

Nom. Deal, buying prices

No. 1 Composition Red Brass

New York	9.00- 9.25
Cleveland	9.25-9.50
Chicago	9.50-9.75
St. Louis	9.00-9.25

Heavy Copper and Wire

*New York, No. 1	11.37½-11.62½
Cleveland, No. 1	11.00-11.25
Chicago, No. 1	11.25-11.50
St. Louis, No. 1	11.00-11.25

Composition Brass Borings

New York	8.50-8.75

Light Copper

*New York	9.12½-9.37½
Cleveland	9.00-9.25
Chicago	9.25-9.50
St. Louis	9.25-9.50

Light Brass

Cleveland	5.25-5.50
Chicago	6.25-6.50
St. Louis	5.75-6.00

Lead

New York	5.75
Cleveland	5.00
Chicago	5.50-5.62½
St. Louis	5.00-5.25

Zinc

New York	3.75- 4.00
Cleveland	3.00-3.25
*St. Louis	4.00-4.25

Aluminum

Borings, Cleveland	9.75-10.00
Mixed cast, Cleve.	12.75-13.00
Clips, soft, Cleve.	14.75-15.00
Mixed cast, St. L.	12.75-13.00

SECONDARY METALS

Brass, ingot 85-5-5-5, lcl,	14.25
Stand. No. 12 alum.	18.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (k)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	3.10c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.25c
San Francisco	4.05c
Seattle (l)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, 5/16-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, 5/16-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 9

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	Continental: **Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$29.76 6 0 0	$23.96	3 0 0
Basic bessemer	19.47 3 18 6	23.57	2 19 0
Hematite, Phos. .03-.05	35.96 7 5 0*	.....	.....
SEMIFINISHED STEEL			
Billets	$39.06 7 17 6	$42.94	5 7 6
Wire rods, No. 5 gage	53.69 10 16 6	48.92	6 2 6
FINISHED STEEL			
Standard rails	$50.22 10 2 6	$45.92	5 15 0
Merchant bars	2.43c 11 0 0	2.16c to 2.26c	6 0 0 to 6 5 0
Structural shapes	2.35c 10 12 6	1.94c	5 7 6
Plates, †¼ in. or 5 mm.	2.56c 11 11 3	2.57c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.32c 15 0 0	3.17c	8 15 0††
	4.14c 18 15 0	4.07c	11 5 0
Sheets, gal., 24 gage, corr.	3.03c 13 15 0	2.35c	6 10 0
Bands and strips	4.31c 19 10 0	2.53c	7 0 0
Plain wire, base			
Galvanized wire, base	5.14c 23 5 0	3.17c	8 15 0
Wire nails, base	4.09c 18 10 0	2.89c	8 0 0
Tin plate, box 108 lbs.	$ 6.45 1 6 0	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$25.05 5 1 0(a)	$18.43	505	$27.80	825	$25.31	63
Basic bessemer pig iron	24.80 5 0 0(a)	.....	.....	.....	.....	27.92 (b)	69.50
Furnace coke	8.80 1 15 6	5.77	158	7.25	215	7.63	19
Billets	39.06 7 17 6	26.46	725	32.35	960	38.76	96.50
Standard rails	2.24c 10 2 6	1.79c	1,050	2.06c	1,375	2.38c	132
Merchant bars	2.53c 11 9 0	1.63c	960	1.65c	1,100	1.98c	110
Structural shapes	2.44c 11 0 6	1.59c	935	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.59c 11 14 3	2.03c	1,195	2.06c	1,375	2.29c	127
Sheets, black	3.48c 15 15 0§	2.70c	1,590‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.31c 19 10 0	3.83c	2,250	2.85c	1,900	6.66c	370
Plain wire	4.31c 19 10 0	2.52c	1,480	2.49c	1,650	3.11c	173
Bands and strips	2.70c 12 4 0	1.84c	1,080	2.33c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough. b hemetite. ††Close annealed.

**Gold pound sterling carries a premium of 64 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham,† No. 1	15.00-16.00
Birmingham,† No. 2	14.00-15.00
Bos. dock No. 1 exp.	18.00
N. Eng. del. No. 1	17.50
Buffalo, No. 1	19.50-20.00
Buffalo, No. 2	17.50-18.00
Chicago, No. 1	18.00-18.50
Cleveland, No. 1	19.50-20.00
Cleveland, No. 2	18.00-18.50
Detroit, No. 1	16.50-17.00
Eastern Pa., No. 1	19.50
Eastern Pa., No. 2	16.50-17.00
Federal, Ill.	15.50-16.00
Granite City, R. R.	17.50-18.00
Granite City, No. 2	15.50-16.00
New York, No. 1	†16.50
N. Y. dock No. 1 exp.	16.50-17.00
Pitts. No. 1 (R. R.)	22.50-23.00
Pitts., No. 1 (dlr.)	20.50-21.00
Pittsburgh, No. 2	18.50-19.00
St. Louis, R. R.	17.50-18.00
St. Louis, No. 2	15.50-16.00
Toronto, dlrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	21.00-22.00

COMPRESSED SHEETS

Buffalo, dealers	18.50-19.00
Chicago, factory	17.25-17.75
Chicago, dealer	16.50-17.00
Cleveland	19.00-19.50
Detroit	18.00-18.50
E. Pa., new mat.	19.00-19.50
E. Pa., old mat.	14.50-15.00
Pittsburgh	20.50-21.00
St. Louis	12.50-13.00
Valleys	20.50-21.00

BUNDLED SHEETS

Buffalo	13.50-14.00
Cincinnati, del.	13.50-14.00
Cleveland	14.00-14.50
Pittsburgh	18.50-19.00
St. Louis	11.50-12.00
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	13.25-13.75
Cincinnati	12.00-12.50
Detroit	13.25-13.75
St. Louis	10.50-11.00

STEEL RAILS, SHORT

Birmingham	17.00-18.00
Buffalo	24.00-25.00
Chicago (3 ft.)	20.50-21.00
Chicago (2 ft.)	21.50-22.00
Cincinnati, del.	21.50-22.00
Detroit	22.50-23.00
Pitts. 3 ft. and less	25.00-25.50
St. Louis, 2 ft. & less	20.00-20.50

STEEL RAILS, SCRAP

Boston district	†15.50-15.75
Buffalo	21.50-22.50
Chicago	18.50-19.00
Cleveland	21.00-21.50
Pittsburgh	22.50-23.00
St. Louis	21.00-21.50

STOVE PLATE

Birmingham	10.00-10.50
Boston district	†11.00-11.25
Buffalo	15.50-16.50
Chicago	11.00-11.50
Cincinnati, dealers	10.50-11.00
Detroit, net	12.25-12.75
Eastern Pa.	16.00-16.50
New York fdry.	†12.00-12.50
St. Louis	12.50-13.00
Toronto, deal'rs, net	9.50-10.00

SPRINGS

Buffalo	23.00-23.50
Chicago, coil	23.50-24.00
Chicago, leaf	21.50-22.00
Eastern Pa.	25.50-26.00
Pittsburgh	25.25-25.75
St. Louis	22.00-22.50

ANGLE BARS—STEEL

Chicago	19.50-20.00
St. Louis	19.00-19.50

RAILROAD SPECIALTIES

Chicago	21.50-22.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	23.00-23.50
Cleveland, billet, bloom crops	24.50-25.00
Eastern Pa., crops	25.50-26.00
Pittsburgh, billet, bloom crops	25.50-26.00
Pittsburgh, sheet bar crops	25.00-25.50

FROGS, SWITCHES

Chicago	18.00-18.50
St. Louis, cut	19.00-19.50

SHOVELING STEEL

Federal, Ill.	15.50-16.00
Granite City, Ill.	15.50-16.00
Toronto, dealers	9.00- 9.50

RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district	†10.00-10.25
Buffalo, No. 1	17.50-18.00
Buffalo, No. 2	20.00-20.50
Chicago, No. 1 net	16.00-16.50
Cincinnati, No. 2	16.50-17.00
Eastern Pa., No. 1	21.00-21.50
St. Louis, No. 1	15.50-16.00
St. Louis, No. 2	17.50-18.00
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	17.00-17.50
New York	†12.50-13.00

BUSHELING

Buffalo, No. 1	17.50-18.00
Chicago, No. 1	16.50-17.00
Cincin., No. 1, deal.	15.00-15.50
Cincinnati, No. 2	8.50- 9.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1 new	16.00-16.50
Valleys, new. No. 1	19.50-20.00
Toronto, dealers	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	12.50-13.00
Chicago	10.50-11.00
Cincinnati, dealers	10.50-11.00
Cleveland	13.00-13.50
Detroit	12.00-12.50
Eastern Pa.	13.00-13.50
New York	†10.00-10.50
Pittsburgh	15.25-15.75
St. Louis	10.00-10.50
Toronto, dealers	8.00- 8.50
Valleys	14.75-15.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†8.50
Buffalo	13.00-13.50
Cincinnati, dealers	9.50-10.00
Cleveland	14.00-14.50
Detroit	12.75-13.25
Eastern Pa.	12.50-13.00
New York	†9.00- 9.50
Pittsburgh	15.00-15.50
Toronto, dealers	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00- 8.50
Boston dist. chem.	†10.00
Bos. dist. for mills	†10.00
Buffalo	13.00-13.50
Chicago	11.50-12.00
Cincinnati, dealers	9.50-10.00
Cleveland	13.50-14.00
Detroit	12.75-13.25
E. Pa., chemical	14.50-15.00
New York	†9.50-10.00
St. Louis	9.00- 9.50
Toronto, dealers	9.00

PIPE AND FLUES

Cincinnati, dealers	11.00-11.50
Chicago, net	13.50-14.00

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	12.00-12.50
Cincinnati	10.50-11.00
Eastern Pa.	15.50-16.00
New York	†12.00-12.50
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	12.75-13.00
Buffalo	17.50-18.00
Cleveland	17.50-18.00
Detroit	15.50-16.00
Pittsburgh	18.00-18.50

FORGE SCRAP

Boston district	†9.50-10.00
Chicago, heavy	21.50-22.00

ARCH BARS, TRANSOMS

St. Louis	20.00-20.50

AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-16.50
Chicago, elec. fur.	18.00-18.50
Eastern Pa.	18.00-18.50
St. Louis	14.00-14.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	22.00-22.50
Boston district	†24.00-25.00
Chicago, net	25.50-26.00
Eastern Pa.	26.00-26.50
St. Louis	24.00-24.50

SHAFTING

Boston district	†19.25-19.50
New York	†19.50-20.00
Eastern Pa.	25.00-25.50
St. Louis	19.50-20.00

CAR WHEELS

Birmingham	18.00-19.00
Boston dist., iron	†15.00-15.25
Buffalo, iron	23.00-23.50
Buffalo, steel	23.00-24.00
Chicago, iron	19.50-20.00
Chicago, rolled steel	21.50-22.00
Cincinnati, iron	18.00-18.50
Eastern Pa., iron	20.50-21.00
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	20.50-21.00
Pittsburgh, steel	25.25-25.75
St. Louis, iron	20.00-20.50
St. Louis, steel	22.00-22.50

NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†15.00-15.50
N. Eng. del. No. 2	17.00
N. Eng. del. textile	18.50
Buffalo, cupola	18.00-18.50
Buffalo, mach.	19.00-20.00
Chicago, agri. net	13.00-13.50
Chicago, auto	14.50-15.00
Chicago, mach. net	15.00-15.50
Chicago, railr'd net	14.00-14.50
Cincin., mach. cup.	15.00-15.50
Cleveland, mach.	19.50-20.50
Eastern Pa., cupola	20.50-21.00
E. Pa., mixed yard	18.00
Pittsburgh, cupola	20.00-20.50
San Francisco, del.	13.50-14.00
Seattle	8.00- 9.00
St. Louis, No. 1	14.00-14.50
St. L., No. 1, mach.	15.00-15.50
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break.	†14.50
N. Eng. del.	15.00-15.25
Buffalo, break.	16.00-16.50
Cleveland, break.	17.00-18.00
Detroit, break.	14.50-15.00
Detroit, auto net	16.00-16.50
Eastern Pa.	19.50
New York, break.	†14.50-15.00
Pittsburgh	17.00-17.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	20.50-21.00
Chicago, R. R.	19.00-19.50
Cincin., agri. del.	16.50-17.00
Cleveland, rail	21.50-22.00
Detroit, auto	16.50-17.00
Eastern Pa., R. R.	20.00-20.50
Pittsburgh, rail	21.00-21.50
St. Louis, R. R.	19.50-20.00

RAILS FOR ROLLING

5 feet and over

Birmingham	19.00-20.00
Boston	†17.50-18.00
Chicago	20.00-20.50
Eastern Pa.	22.00-22.50
New York	†17.50-18.00
St. Louis	21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	22.00-22.50
St. Louis, No. 1	19.50-20.00

LOW PHOS. PUNCHINGS

Buffalo	23.00-23.50
Chicago	21.50-22.00
Eastern Pa.	25.50-26.00
Pittsburgh (heavy)	24.00-24.50
Pittsburgh (light)	23.00-23.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic	
Foreign manganiferous ore, 45.55% iron, 6-10% man.	*17.00
No. Afr. low phos.	20.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*16.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	nominal
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50

*Nominal asking price for spot.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. .52.00 to 53.00
So. African, 50-52%	non. 52.00 to 53.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 88

New York—With new demand still lagging, sheet delivery shows further improvement. Cold-finished sheets are available in three to four weeks, although this situation, especially as it affects the lighter gages, may change soon, as automotive requirements expand. Hot-rolled, in the heavier gages, is available in about four weeks, depending upon specifications, and, in the lighter gages, in not much under eight to 10 weeks. In some cases, sellers are sold up practically throughout the remainder of the year on these latter gages. Galvanized sheets are offered by several mills at around four to five weeks; some other mills appear further booked ahead. To date there has been little interest among jobbers notwithstanding the proposed new schedules on galvanized sheets, eliminating the functional discount of $2 a ton. This schedule was to become generally operative October 1; however, some mills were so well booked ahead at the time the changes were originally announced that they could not offer any protection to their customers and the result is that several mills are offering to accept tonnage on the present basis for delivery up to Nov. 1.

Central Supplies Co. of America, 500 Fifth avenue, New York, quoting material to be supplied by an eastern mill submitted a price of $6.80 per square on 170 tons of copper bearing 2½-inch corrugated galvanized sheets. Another mill quoted $6.76 but was higher on 8000 feet of ridge roll with result that former is expected to receive the award. The Central Supplies Co. also allowed 2 per cent for cash against the usual ½ per cent. Several leading bidders quoted $6.80 per square.

Pittsburgh — New business in sheets continues improving a little. While a fair volume of automotive bookings is reported, considerably more of this business is expected later this month. Successive gains were shown in bookings in the last three weeks of August and it is expected that September may be considerably better. Backlogs are much easier than at any time in the last six months.

Cleveland—In spite of the fact that bookings for cold-rolled material from automotive builders have improved somewhat since the first of the month, shipments on all grades of sheets continue to exceed specifications. However, no heavy tonnage is expected from this source for another two or three weeks. Sellers report little change in miscellaneous requirements as refrigerator, radio and other household equipment manufacturers continue above normal operations. Recent buying is for immediate delivery with little forward purchasing appearing.

Chicago—Automotive sheet buying is increasing more slowly than was anticipated, due to delays in model changes. A more substantial increase in bookings is anticipated before the end of September. Meantime, sheet demand elsewhere lacks improvement though consumption is relatively more active than shipments, due to further reduction in users' stocks. While sheet backlogs still are declining, deliveries of four to five weeks are asked on hot-rolled material and three to four weeks on cold-rolled sheets.

Boston—Improvement in sheet demand is slow, a few sellers noting a slight, but spotty gain for some finishes. Specifications from the larger industrial consumers, notably refrigerator builders, are substantial. Jobbers, through which a good part of the miscellaneous tonnage moves, are buying sparingly of gages and finishes on which stocks are low. Few consumers have covered fully for next quarter, but most larger users are expected to do so within the next two weeks.

Philadelphia—Autobody builders and partsmakers have specified additional tonnage for 1938 models on which preliminary work is now under way. Heintz Mfg. Co., recently strikebound, has started its third shift and now has more than 700 men at work. Sheet demand from the radio trade continues relatively active but miscellaneous consumers are apathetic. Deliveries have improved to about two weeks on hot-rolled from some makers, though others can give no better than seven to eight weeks on hot and galvanized and five to seven weeks on cold-rolled.

Cincinnati—Buying of sheets holds near the August levels, with only a modest upturn evident immediately after the holiday, chiefly in automobile demand. Shipments for stoves and refrigerators and to jobbers, the last-named hastening to stock up before elimination of allowances, are steady, but other miscellaneous needs are light.

Birmingham, Ala. — Demand for sheets continues to feature the steel market with little recession. Pressure for delivery is being exerted in most cases with drum stock sheets the most wanted specification.

St. Louis—Sheet demand has not revived since Labor Day. Deliveries have eased further and backlogs have diminished, while new orders are in moderate volume. The heavier materials are relatively quieter than the lighter gages. Tin plate continues active, with shipments heavy and new orders in fair volume. Galvanized demand is holding its own, with requirements of the general manufacturing trade particularly good.

Strip

Strip Prices, Page 89

Pittsburgh — Excluding the holiday, demand for hot and cold-rolled strip has shown a slight gain. Expected heavier orders for the automotive industry will make September a better month from the standpoint of new business, but the industry has been slow to specify so far. Deliveries continue easy.

Cleveland—Backlogs continue to decline, with most mills now able to make deliveries within one to two weeks. Specifications from auto partsmakers has been disappointing, although some expect a marked improvement soon. Electrical equipment manufacturers are particularly active for this time of the year. Some sellers will have to reduce operations moderately shortly if anticipated revival this fall does not materialize soon.

Chicago—Strip demand is slow to improve, due partly to lack of more definite pickup in automotive buying. Miscellaneous users also have shown only minor changes in their needs the past several weeks. Mill backlogs are small and deliveries are the shortest in many months. A pickup in buying will be necessary to prevent a further curtailment before the end of this month.

Boston—Demand for narrow cold strip continues sluggish with mills selling western accounts noting a slight, but spotty improvement in buying by automotive accessory and part-makers. Industrial consumers in the East are operating largely on inventories. Replacement orders are slow. Such volume is generally for immediate delivery and what advance buying is being done is also mostly by mid-west accounts. Although backlogs are small, finishing mill operations are fairly well sustained by current demand. Hot strip orders are light. Most sellers now look to about Oct. 1 for a pronounced upturn in both narrow cold and hot strip.

New York — With backlogs depleted, narrow cold strip sellers are seeking tonnage with meager success, incoming business being light, spotty and generally for shipment as soon as possible. Little fourth-quarter business has been booked. In the East especially, consumer stocks appear ample for current op-

erations with some fill-in buying on scattered specifications.

Philadelphia—Order backlogs are further depleted and fairly quick delivery is available on both hot and cold-rolled. Consumption is well sustained and better buying is indicated for late this month.

Birmingham, Ala. — Continued influx of business in cotton ties is reported by steelmakers here despite continual rains that have played havoc with the Alabama crop, inflicting an estimated damage of more than $7,000,000.

Plates

Plate Prices, Page 88

Pittsburgh — Plate bookings continue light, without much change from last week. Inactivity in the railroad equipment field is probably the largest single factor contributing to the easier tone, and tank fabricators and other consumers have noted an appreciable slackening in business. One bright spot in the plate market here recently has been the fair foreign inquiry for dredges for South America, the Philippines, and other places. Except for one inquiry for four to six sand barges, this field continues light.

Cleveland—Mill operations continue at a high level with backlogs ranging from two weeks in some instances to as high as six weeks. However, new tonnage is disappointing with tank, boiler and press work at approximately the lowest point of the year. Most of recent requirements is going into small structural jobs. Little additional buying is expected from railroads, outside of necessary maintenance work, until late in fourth quarter.

Chicago — Plate backlogs are shrinking, with new business receiving little support from railroad orders. Fair business is being received from other sources though tonnages show no improvement. Tank fabricators continue well occupied and inquiries and orders are in fair volume. Plates are available within four to five weeks.

Boston — Plate requirements for specified projects are heavier, miscellaneous inquiry has improved and the long range outlook for tonnage continues the best of the heavier steel products. Most boiler shops have more business. A few tank shops, one especially, have placed orders for stock. Deliveries are about normal on the more standard gages and widths. Until recently there has been some farming out of tonnage to meet delivery pressure, but this has largely disappeared. For shafts and tunnels to carry a water line under the Mystic river, Medford, Mass., several hundred tons have been placed, liner plates for the tunnel going to Truscon Steel Co.

New York—Buying of steel plates shows little improvement this month, though the trade expects expasion as the fall advances. Deliveries are uniformly better. United Dry Docks Inc., New York, has been awarded a fire boat by New York, with about 225 tons of hull steel placed with eastern mills.

Philadelphia—Miscellaneous plate business is slow and demand from usual tonnage buyers, such as railroads, shipyards and the oil industry, shows little life. Plate backlogs are down, with delivery in one to two weeks from several mills, though more extended in heavy gages and wider sizes. Inquiry from South African railroads for 45 to 90 locomotives is still active and may be awarded to a local builder.

St. Louis—Heavier demand from oil field and miscellaneous users have improved the plate situation. Barge building has also figured in the betterment. The St. Louis Ship Building Co. is low bidder on 15 pontoons

calling for 500 tons of structural steel plates, for U. S. engineers at Memphis, Tenn.

Birmingham, Ala. — Southern mills are working off existing backlogs in plates, although some new business is coming in, mostly from miscellaneous structural jobs of small nature. Considerable headway is being made toward cleaning up business already on books.

San Francisco—The only pending plate project of size, calls for from 7500 to 9000 tons for a welded steel or precast reinforced concrete pipe line for the Metropolitan water district, Los Angeles. From present indications, as reported by engineers, welded steel pipe quotations are low.

Seattle — Shops report a fair volume of business in small tonnages for tank and boiler repairs and service station construction. No large projects are up for immediate figures but important water pipe and pulp plant projects are expected to be released during last quarter.

Plate Contracts Placed

850 tons, pipe line, Denver, to Thompson Mfg. Co., Denver.

Plate Contracts Pending

500 tons, 15 pontoons for U. S. engineers, Memphis, Tenn., St. Louis Ship Building Co., St. Louis.

115 tons, steel disks and plates for gun shields, navy delivery, Washington; Worth Steel Co., Claymont, Del., low; bids Sept. 7.

Bars

Bar Prices, Page 88

Pittsburgh—Specifications for hot-rolled bars have been only fair, largely due to the holiday. The expected improvement in automotive demand this month will take up some of the slack. In addition, jobber requirements may gain, according to present indications.

Cleveland—Specifications for new models of farm implement manufacturers has been disappointing to some, but most sellers feel that the industry has been forced to delay a few weeks because of the thorough preparations incident to bringing out new models. The same condition prevails as to specifications from the automobile industry. Although in this case considerable tonnage has already been placed with local forging concerns. New business from machine tool builders and nut and bolt manufacturers has held up well, but demand from these channels has been hampered considerably by lack of activity among railroad and automobile builders.

Chicago—Bar demand generally shows no improvement except for further small gains in automotive orders. Shipments continue heavy but backlogs are in need of bolstering. Requirements of farm implement and tractor manufacturers still are heavy and nothing apparently will interrupt brisk schedules of these groups for a number of weeks. Automotive companies are increasing their buying at a slower rate than was anticipated but more substantial gains in demand are looked for within the next two weeks.

Boston—A slight upturn from the recent low level of buying is noted in bar demand. The improvement has been registered mostly by alloy and forging material, notably the former. Soft steel bars are still slack and there has been limited covering for last quarter. Tool steel requirements for machinery and miscellaneous needs are steady. In most instances consumer stocks are not large and mild replacement orders indicate a further improvement in buying before the end of the month.

Bids will close Sept. 21 on approximately 650 tons of pearlitic

TRAM-O-LENE

will

PROTECT AGAINST RUST

During the coming months

•

for use on

HOT and COLD ROLLED SHEET and STRIP

PARTLY FINISHED and FINISHED STEEL SHAPES

STEEL WIRE

Eliminate rejections due to rust in transit

Preserve your steel in storage

WHY WAIT UNTIL IT IS TOO LATE?

PROTECT YOUR STEEL AND PLEASE YOUR CUSTOMERS

•

Write for Samples and Prices Today

THE H. A. MONTGOMERY COMPANY

Main Office: 17191 Swift Ave., Detroit, Mich.

Refinery Division: P. O. Box 548, Findlay, O.

manganese and corrosion resisting bars for delivery to the naval station at Newport, R. I. Of this tonnage 603 tons are of the pearlitic steel.

New York—Bar business is irregular, with carbon grades available in some quarters for almost immediate shipment. Prospects for improved automotive demand in the middle west, however, are encouraging and some sellers look for a rather sharp extension in delivery schedules before the month is over. One encouraging feature recently has been a better volume of specifications from railroad shops for miscellaneous repairs.

Philadelphia—Demand for hot and cold-rolled bars shows little activity and shipments are larger than bookings by a wide margin. Delivery is available in two weeks. Forging shops are fairly active.

Birmingham, Ala. — Manufacturers of agricultural implements are expected to place requirements soon to build up dwindling backlogs in bars, particularly material for plow manufacturers. Demand at present is considerably below current shipments.

Behind the Scenes with STEEL

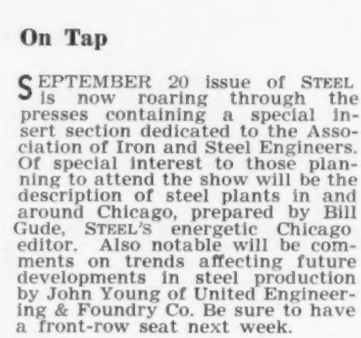
On Tap

SEPTEMBER 20 issue of STEEL is now roaring through the presses containing a special insert section dedicated to the Association of Iron and Steel Engineers. Of special interest to those planning to attend the show will be the description of steel plants in and around Chicago, prepared by Bill Gude, STEEL'S energetic Chicago editor. Also notable will be comments on trends affecting future developments in steel production by John Young of United Engineering & Foundry Co. Be sure to have a front-row seat next week.

* * *

Welded Fashion Plates

NEWLY released is a roster of habiliments for the well-dressed welder, striking a fall fashion note and containing all the fixin's necessary for the compleat welder. Coats, pants, gloves, spats—all are



there for selection by the gentleman's gentleman. For the acme of welding, sartorially speaking, the list seems a bit incomplete without mauve waistcoats, white mufflers, pork pies, or, for the more formal welding occasions, top hat, white tie and tails.

* * *

Lawdy

OUR favorite British correspondent, Lord Nosebywhom, who delights in keeping us in touch with affairs British anent the iron, steel and metalworking industries, has notified us of the fact that a certain company of his realm is definitely and violently interested in STEEL, and especially in its treatment of the subject of furnace atmospheres. Well, if these Englishmen will come in out of the noonday sun long enough to look in STEEL'S cloistered halls of knowledge, they will find on page 70 of this week's book a very fine article indeed on the generation of controlled atmosphere for heat treating furnaces.

* * *

Coming Up

LOOMING over the horizon like the swarm of locusts we saw in "The Good Earth" is coming the October 11 issue of STEEL which will be devoted to the Metal Show and the five societies which combine to make this the biggest metal event of the year. All advance dope points to a mighty powerful issue. Editors are already shaking in their shoes at the thought of midnight sessions and encounters with waxy-mustached advertising men who come in after the layouts have been made up and crack their whips of commercialism, tearing out innocent editorial pages in order that some new advertiser may have the benefits of an appearance before your eyes.

* * *

Poverty

PITY the poor steelworker, who has just enough money to buy himself a car and move out to the country, where he lives in peace and quietude, according to the story prepared by STEEL'S editors beginning on page 17. We are thinking seriously of hunting up a few steelworkers and trying to arrange for them to help us pay for our automobile, or maybe buy the 1936 model they will turn in next month on the new one. Or maybe we could rush out and buy their excess tomatoes cheap.

—SHRDLU

Pipe

Pipe Prices, Page 89

Pittsburgh — New business has been slightly easier and tubular goods producers continue cutting into backlogs. Demand for seamless mechanical has eased. As it is now getting late in the year for any line pipe work in the northern part of the nation, some of the recently projected plans undoubtedly will be held over until next spring. Prices are steady.

Cleveland — Largest pipe award in some time was placed with Republic Steel Corp., Cleveland, recently, when Standard Oil of Ohio awarded 110 miles of gas lines between Cleveland and Akron, Toledo and Fostoria, and Latonia, Ky., and Cincinnati, involving close to 5000 tons of steel pipe of various sizes, ranging from 4 to 6 ⅝-inch. Pending tonnage is confined to small jobs for industrial expansion and repairs. Domestic requirements continue disappointing.

Chicago—Cast iron pipe shows little change from the average of past several weeks. Orders and inquiries are for small lots. Producers anticipate little improvement during coming weeks and the total for the year is thought likely to fall below earlier expectations.

Boston—Unexpected cast pipe inquiries for estimates include several thousand tons. Plans are underway for a 20-mile water line on Cape Cod, Mass., indications being that section will be an increasing consumer. Despite adverse comment, 750 tons for the Buzzards Bay extension will be furnished by French foundries. Worcester, Mass., has authorized an additional $50,000 for water works and requirements against the blanket pipe contract for that city will be increased. Demand for merchant steel pipe is steady, but not heavy with some distributors buying to balance stocks. Except for a 54-inch i.d. line at Waterbury, Vt., on which bids are in, large steel pipe inquiry is lacking.

New York—Bids on 6210 tons of cement-lined cast pipe, New York city yard stocks, opening Sept. 8, averaged lower than prices quoted several weeks ago on the same type. For the bulk of 12-inch, $55.70, delivered, was low while on more than 850 tons of 8-inch a low of $53.75 was submitted. The Burlington, N. J., foundry is low on the bulk, but two others will share the business. Except for this inquiry, to be followed by another 3800-ton New York

city opening late this month, buying is light and in small lots. Close to 5000 tons is being figured for work in Westchester county, New York, but the material is not yet out for figures.

Birmingham, Ala.—Inquiries and awards for cast iron pipe are light with production continuing at an estimated 60 per cent or slightly better. American Cast Iron Pipe Co. remains on a four day week.

San Francisco—The second largest cast iron pipe award this year was made by Los Angeles. United States Pipe & Foundry Co., obtained 1900 tons of 6 and 8-inch and American Cast Iron Pipe Co. took 300 tons. Pending business is all confined to lots of less than 100 tons.

Seattle—Allocation of federal funds has stimulated interest in cast iron and other types of pipe. Many cities plan extended improvements. Seattle is considering Ninth avenue SW pipe line which may involve over 1000 tons. Scio, Oreg., will lay an unstated tonnage of 6-inch cast iron. Dayville, Oreg., has contracted for a reservoir and two miles of pipe. Ontario, Oreg., has been allotted PWA funds for a proposed $70,000 low pressure system, plans by L. B. Stockman, Baker, Oreg. Cut Bank, Mont., is planning a $90,000 filtration plant and a $65,000 storage reservoir. Twisp, Wash., will invite bids soon for a $35,000 system, including wells, pumps, reservoir and 13,000 feet of 4 to 8-inch cast iron and accessories. Tenino, Wash., is having plans prepared for a proposed $92,000 project; involving purchase of a private system, construction of a reservoir and six miles of 2 to 6-inch steel or cast iron, plans by Parker & Hill, Seattle. Lowell, Wash., has authorized a $53,000 bond issue for improvements, including new wells, equipment, one steel and two concrete tanks and five miles of 2 to 6-inch steel pipe. Monroe, Alderwood Manor and other Washington towns are also planning water system projects.

Steel Pipe Placed

5000 tons, pipe lines, between Cleveland and Akron, Toledo and Fostoria, O., and Latonia, Ky., and Cincinnati, for Standard Oil of Ohio, to Republic Steel Corp., Cleveland.

675 tons, steel pipe and fittings, delivery Batesville, Miss., for United States engineer, Vicksburg, Miss., to Nashville Bridge Co., Nashville, Tenn.

Cast Pipe Placed

2200 tons, 6 and 8-inch, Los Angeles, specification X 104; divided between United States Pipe & Foundry Co., Burlington, N. J., 1900 tons, and American Cast Iron Pipe Co., Birmingham, Ala., 300 tons.

275 tons, 12-inch, Newton, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

200 tons, Port Richmond, Staten Island, N. Y., to Donaldson Iron Works, Emaus, Pa.; contractor's letting.

150 tons, 14-inch for Puyallup, Wash., to Pacific Water Works Supply Co., Seattle.

Cast Pipe Pending

6210 tons, 6, 8 and 12-inch, cement lined, borough yard stocks, New York, United States Pipe & Foundry Co., Burlington, N. J., low on bulk; Central Foundry Co. low on approximately 873 tons, and Warren Foundry & Pipe Co., Phillipsburg, N. J., low on about 847 tons. Bids Sept. 8. United States Pipe & Foundry Co. also on 182 tons, fittings.

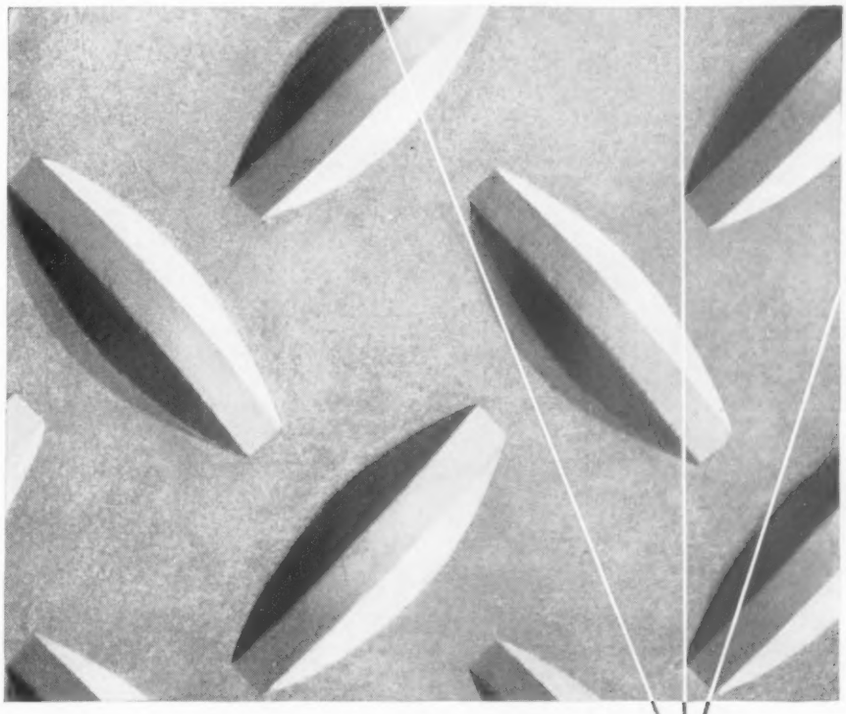
165 tons, 4 to 10-inch; bids at Helena, Mont., Sept. 13.

Unstated tonnage, 2800 feet 6-inch class 250 water pipe, Neenah, Wis.; bids Sept. 13.

Cold-Finished

Cold Finished Prices, Page 89

Pittsburgh—Tonnages from the automotive industry which cold-finished bar producers expected in



INLAND 4-WAY FLOOR PLATE

. . . Safe from Every Angle

Inland 4-Way Floor Plate maintains rugged protection in all 4 directions against slipping and falling accidents. It gears the floor of your plant safely to the moving feet and wheels that speed your production.

Inland 4-Way Floor Plate provides 4-way safety, cleaning, stiffness and matching, and gives a neat modern appearance to all floors.

Write for our new catalog.

SHEETS • STRIP • TIN PLATE • BARS • RAILS • REINFORCING BARS • PLATES • FLOOR PLATES
STRUCTURALS • PILING • ETC.

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois • Offices in: Detroit – Kansas City – Milwaukee – St. Louis – St. Paul

the early days of September have been slow in materializing, but are confidently anticipated soon. Ordering from miscellaneous consumers continues light. Deliveries are easy. To replenish depleted stocks, some jobbers have been buying more actively. Shipments to textile machinery manufacturers are among the heaviest of many consuming outlets.

Transportation

Track Material Prices, Page 89

New York—Pending clarification of the railroad outlook with respect to wage rates and freight rates, which some leading transportation interests believe may come very shortly, the equipment market continues to mark time. Virtually the only new inquiry involves 19 lightweight passenger cars for the Pennsylvania. Bids are being asked for Sept. 16; however, plans involve certain alternates which make figuring difficult, with a result that some car builders doubt if they will be able to supply estimates by that time. As a matter of fact, car builders are none too hopeful of participating in view of the Pennsylvania's usual disposition to build cars in its own shops. Some car builders are unable to recall any passenger car awards in recent years to have been made by the Pennsylvania to outside shops.

Miscellaneous orders for accessories and for various steel products for car repair purposes are being placed, but represent no improvement in volume over the previous rate of buying. The Soo line has closed on 100 box cars with Pullman-Standard Car Mfg. Co. but few additional inquiries are pending.

New York Central is inquiring for about 5000 tons of rails and splice bars, bids Sept. 16. This is for fill-in needs for the remainder of the year.

New York board of transportation will open bids Sept. 17 for switch points and frogs for replacements and Sept. 24 on switch and frog assemblies for Queens Plaza.

Car Orders Placed

Minneapolis, St. Paul & Sault Ste. Marie, 100 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Automatic
GAS SAVING EQUIPMENT
WELDIT MODEL "W"
Automatic WELDING TORCH
Thumb lever in handle controls welding flame. Release of thumb reduces flame to pilot size. No re-lighting or re-adjusting of flame necessary between welds. Saves 25% to 50% gas alone. Weight 13 oz. Length 14½ inches. Tip sizes 3 thru 8.
WELDIT MODEL "A-20"
Automatic WELDING TORCH
Has automatic shut-off (gas saving) feature for intermittent welding work or instantly adaptable to continuous welding job by simply sliding thumb lever into retaining or locking slot. Weight 1 lb. 10 oz. Length 18 inches. Tip sizes 2 thru 12.
WELDIT MODEL "E"
GASAVER
Hanging torch on Gasaver hook, between welds, automatically shuts off intake lines, saves gas. Lifting torch off hook and passing across pilot light instantly produces full welding flame, no re-adjusting necessary.
WELDIT ACETYLENE CO.
642 BAGLEY AVE. DETROIT, MICH.
Free TEST FOR TWO WEEKS IN YOUR PLANT

Car Orders Pending

Pennsylvania, 19 lightweight coaches, including six passenger coaches, five diners, four baggage and mail cars and four passenger and baggage cars; bids asked.

Wire

Wire Prices, Page 89

Pittsburgh—Barbed wire, nails and rods are the subject of active inquiry from abroad, but the desire of exporters to beat down prices and difficulty in obtaining ships have been adverse factors. While backlogs generally are easy, an active fall is still expected. Producers are counting on fair automotive business and better jobber orders.

Cleveland—While demand for merchant products has held up well, immediate outlook is not as promising as a month or two ago. To date little forward buying has appeared, but with prompt deliveries available and prices definitely settled for fourth quarter this is not surprising. Miscellaneous requirements for manufacturing wire, excluding automotive sources, has resisted seasonal influences better than anticipated.

Chicago—Despite some gains from the automotive industry, pickup in demand from that direction is somewhat less than had been anticipated. Delays in changing to new models are regarded as only temporary, however. Occasional improvement in manufacturers' wire business is noted from other consumers and activity in merchant wire products is receiving support from the continued favorable situation in agriculture. Outlook for the latter during coming months is particularly bright.

Boston—Broadening improvement in wire buying includes slightly more tonnage for fourth quarter shipment, better demand for merchant wire products, notably nails, and a pick-up in more specialties, manufacturers' wire and light spring material. Character of buying by manufacturing consumers indicates uneven stocks, some specifications being well depleted while others are still ample for immediate needs. Much current demand is for fill-in. Some finishing departments are stepping up production schedules. For a bridge, Deer Isle, Me., closing Oct. 2, approximately 208 tons of cable strand are required. Heavier products, cable guard rails and electrical cable are in steady demand.

New York—Replacement buying of manufacturers' wire tends to increase, total orders showing slight improvement. Recent pick-up in light spring wire continues. Not much change has taken place in de-

mand for merchant wire goods. While some fourth quarter business is being placed, the bulk of orders are for early delivery.

Birmingham, Ala. — The slight improvement noted two weeks ago in demand for wire products continues, but there is no immediate indication of a general revival. Industrial interests believe adoption of the quantity plan of selling will have a favorable effect generally. Sales are not much above 50 per cent of shipments now.

Shapes

Structural Shape Prices, Page 88

New York—Over 10,000 tons were involved in two awards late last week. The superstructure for the west side elevated highway, New York, taking 7503 tons and the upper deck Henry Hudson bridge, New York, requiring 2500 tons. Three schools in New York city, on which bids were taken on the steel work direct, take 2395 tons, the contracts being tentatively awarded to two fabricators. There has been a noticeable drop in new inquiry for industrial and commercial building expansion.

Boston—For a bridge, Deer Isle-Sedgwick, Me., closing Oct. 2, close to 2000 tons will be required. First bid last February, the project was held up by lack of funds. Revised plans call for about 25 per cent more structural steel. Tonnage for the power house, South Boston, will also be heavier, about 2250 tons, the contract to be placed shortly. Small bridge inquiry continues active, mostly stringer spans, the Calvin Coolidge Memorial span, Northampton, Mass., about to come out, being an exception. Awards approximate 1000 tons with two building projects, Lowell and South Boston, Mass., 600 tons, going to the Everett, Mass., shop.

Philadelphia—Pennsylvania state authority has granted PWA allotment $7,095,000 for construction of the finance building, Harrisburg, as part of Pennsylvania state institutional program, now active after a long delay. The finance building will take around 5000 tons and under federal requirements, construction must start Nov. 8. Additional state jobs are expected shortly. Private work continues slow with a number of jobs reported held up due to rising costs.

Pittsburgh—Awards for structural shapes are much lighter than in other recent weekly periods, partly due to the Labor day holiday. Inquiry is headed by 3000 tons for a temporary trestle over Rikers Island channel, Queens, N. Y.

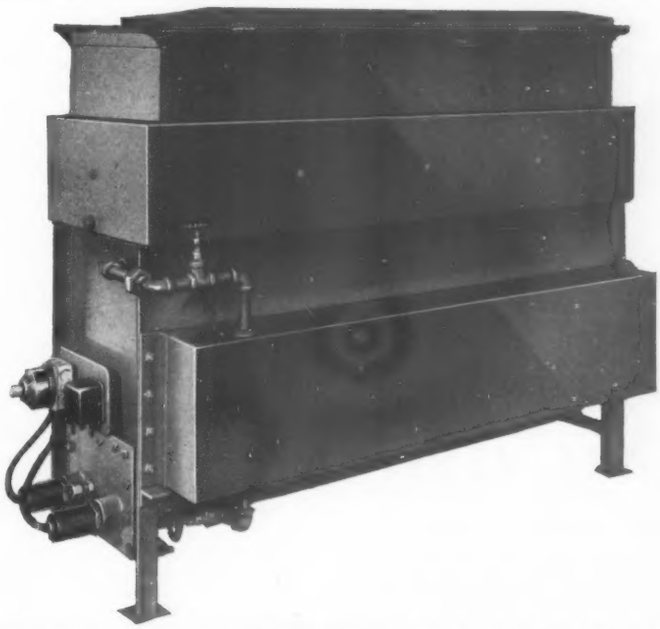
Chicago—Allis-Chalmers Mfg. Co. has placed 2000 tons for plant extensions at LaCrosse, Wis., but structural awards otherwise are confined almost entirely to small lots.. Inquiries also show no improvement, being headed by 1000 tons for Caterpillar Tractor Co., Peoria, Ill. A building here for the Glidden Co. involves 450 tons.

Cleveland—Structural awards continue to show improvement through

Shape Awards Compared

	Tons
Week ended Sept. 11	**23,743**
Week ended Sept. 4	**21,387**
Week ended Aug. 28	**25,878**
This week, 1936	**19,305**
Weekly average, 1936	**16,332**
Weekly average, 1937	**25,659**
Weekly average, August	**21,801**
Total to date, 1936	**837,061**
Total to date, 1937	**949,369**

Includes awards of 100 tons or more.



WHY A MANUFACTURER OF METAL OFFICE EQUIPMENT USES DETREX DEGREASING

A large manufacturer of metal office equipment gives the following reasons for operating a DETREX VH 400 Degreasing Machine on his production.

1—Less space and time are required for cleaning
2—No oil or chemical residue left on the metal to bleed out after finishing
3—No oil seepage from seams
4—Cleaning costs reduced over previous method
5—Better finish possible
6—Elimination of rejects due to improper cleaning
7—No fire hazard—Perm-A-Clor Solvent is non-inflammable.

Ask for information on your cleaning problems.

DETROIT REX PRODUCTS COMPANY

Metal Cleaning Engineers—Solvent Degreasing and Alkali Cleaning
13013 HILLVIEW AVENUE DETROIT, MICHIGAN
New York Office: 130 West 42nd St. Chicago Office: 201 North Wells St.
Cleveland Office: 812 Huron Rd.

AT THE HEART

... and in the heart...

OF CLEVELAND

A red-cap is the only taxi you need when you come to Cleveland—because Hotel Cleveland adjoins the Union Terminal. And here you're at the heart of the city—next door to everything you want to see.

But convenience is only one of many reasons you'll like Hotel Cleveland. Food we believe unequalled in hotels ... more like a transatlantic liner ... served in four colorful restaurants. Friendliness you'll be quick to sense ... a *genuine* interest in seeing that you enjoy every moment in our hotel and city. A room as crisp and thoughtfully arranged as your own at home. Public rooms to match your mood—home-like quiet, restful concert music, or gay dancing.

Small wonder that Clevelanders prefer the Cleveland, and experienced travelers warmly agree with them.

HOTEL CLEVELAND Cleveland

the second week of Sept., with American Bridge Co., Pittsburgh, receiving 815 tons for an addition to Timken Steel & Tube Co.'s plant, Canton, O. Both public and private inquiries are encouraging, with numerous small projects well under 100 tons for plant improvements and good size bridge work scheduled to be placed within the near future.

Birmingham, Ala. — Shapes continue in demand from miscellaneous sources but not in quantity except for recent award for use in the Baton Rough bridge. Considerable backlog, however, remains to be worked off and the flow of new business in small lots is fairly steady.

San Francisco—Less than 1400 tons of structural awards were reported placed during the past week. Consolidated Steel Corp., Los Angeles, is low bidder on buildings for Johns-Manville Corp., Los Angeles.

Seattle — Backlogs are above normal, one local plant being booked to the end of the year. Highway projects and reclamation jobs continue important. United States engineer, Bonneville, Idaho, has placed 1000 tons for gates, stoplogs, trash racks and miscellaneous, Pacific Car & Foundry Co. being awarded 500 tons, the balance to Lakeside Bridge & Steel Co., Milwaukee, and other fabricators.

Shape Contracts Placed

7503 tons, superstructure west side elevated highway, Canal to Duane streets, New York, to Harris Structural Steel Co., New York; through James Stewart & Co., New York.

2500 tons, upper deck administration building and toll booths, Henry Hudson bridge, New York, to American Bridge Co., Pittsburgh.

2000 tons, plant extension, Allis-Chalmers Mfg. Co., LaCrosse, Wis., to Worden-Allen Co., Milwaukee.

1600 tons, warehouse, Firestone Tire & Rubber Co., Memphis, Tenn., to Carnegie-Illinois Steel Co., Pittsburgh.

1100 tons, public school 252, Brooklyn, N. Y., to Post & McCord, New York, $100,000; bids Sept. 8, steel work direct, fabricating and erecting.

900 tons, public school 160, Queens, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa., $81,390, bids Sept. 8, steel work direct, fabricating and erecting.

815 tons, plant addition, Timken Steel & Tube Co., Canton, O., to American Bridge Co., Pittsburgh.

500 tons, trash racks and miscellaneous, Bonneville dam project, Oregon, to Lakeside Bridge & Steel Co., Milwaukee., and other fabricators.

500 tons, stoplogs and gates, Bonneville dam project, Oregon, to Pacific Car & Foundry Co., Seattle.

405 tons, service building, Westinghouse Electric & Mfg. Co., South Boston, Mass., to New England Structural Co., Everett, Mass.; Stone & Webster Inc., Boston, general contractor.

400 tons, two-story store building, Eighth avenue and 124th street, New York, to Bethlehem Steel Co., Bethlehem, Pa.

395 tons, addition, public school 142, Queens, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa., $36,276, bids Sept. 8, steel work direct, fabricating and erecting.

375 tons, bridge, Oconee river, near Balls Ferry, Ga., to Nashville Bridge Co., Nashville, Tenn.; bids Aug. 27, state highway board, Atlanta.

370 tons, Power house, Ternstedt Mfg. Co., Trenton, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

355 tons, addition, Carr-Lowrey Glass Co., Baltimore, to Maryland Steel Products Co., Baltimore.

325 tons, alterations, stockyards building, New York Central railroad, New York, to American Bridge Co., Pittsburgh; through James Stewart & Co., New York.

300 tons, postoffice, Muskogee, Okla., J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

270 tons, state bridge, Ontario, Oreg., to unnamed interest; C. J. Montag, Portland, general contractor.

250 tons, garage and laboratory building extension, Electric Illuminating Co., Cleveland, to Patterson & Leitch Co., Cleveland.

245 tons, Michael Cohen apartment building, Charleston, W. Va., to Trojan Steel Co., Charleston.

200 tons, exchange addition, New England Telephone & Telegraph Co., Lowell, Mass., to New England Structural Co., Everett, Mass.

200 tons, Union avenue, Portland, state crossing, to unnamed interest; Averill & Corbett, Portland, Oreg., general contractor.

200 tons, building, Kress Co., Rockford, Ill., to Mississippi Valley Structural Steel Co., Chicago.

190 tons, St. Andrews church, Duane street, New York, to Post & McCord, New York; through William L. Crow Construction Co., New York.

185 tons, seven buildings, E. I. duPont DeNemours & Co., Carneys Point, N. J., to Belmont Iron Works, Eddystone, Pa.

165 tons, beam spans, Missouri Pacific railroad, Pyatt, Ark., to Stupp Bros. Bridge & Iron Works, St. Louis.

165 tons, bridge FAP 167-A, Sierra county, New Mexico, to Darvyshire-Harvie Iron & Machine Co., El Paso, Tex.

150 tons, beams, subway, Huntington avenue extension, Boston, to Carnegie-Illinois Steel Corp., Pittsburgh.

140 tons, shapes and bars, addition, school, Great Neck, N. Y., to August Bellon Iron Works, Rockaway Beach, N. Y., and Bethlehem Steel Co., Bethlehem, Pa.; W. L. Oestreicher Co., Great Neck, general contractor.

140 tons, state bridges, Blain county, Montana, to unnamed interests.

135 tons, refinery equipment, Universal Oil Products Co., New York, to Belmont Iron Works, Eddystone, Pa.

125 tons, conveyor supports, Chesapeake-Camp Corp., Franklin, Va., to Richmond Structural Steel Co., Richmond, Va.

115 tons, bridge FAP-75, Wilcox and Marengo counties, Alabama, to Virginia Bridge Co., Birmingham.

110 tons, bridge SP-626-A, De Baca county, New Mexico, to Midwest Steel & Iron Works, Denver.

110 tons, sheet piling, retaining wall for City of Ithaca, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

105 tons, post office, Santa Monica, Calif., to Bethlehem Steel Co., Los Angeles.

100 tons, addition, court house and post office, Louisville, Ky., to Snead Architectural Iron Works, Louisville, Ky.; Algernon Blair, Montgomery, Ala., general contractor.

100 tons, Washington state bridge over Raging river, to Pacific Car & Foundry Co., Seattle.

Shape Contracts Pending

18,000 tons, estimated main span, Bronx-Whitestone bridge, New York; to be advertised Sept. 15 for closing early in October.

2400 tons, Mellon art gallery, Washing-

ton; Marc Eidlitz & Son, New York, general contractors, to place steel late next month; project also takes 850 tons reinforcing bars.

2250 tons, revised estimate, power house, Edison Electric Illuminating Co., South Boston, Mass.; Thomas O'Connor Co., Boston, contractor.

2000 tons, bridge, Deer Isle-Sedgwick, Me.; bids Oct. 2. Previous tenders Feb. 11 withdrawn. Work also takes approximately 208 tons of cable strand and 300 tons, reinforcing bars. Revised plans take approximately 25 per cent more structural steel; Robinson & Steinman, New York. Phoenix Bridge Co., Philadelphia, was low on structural steel, previous opening.

1000 tons, building, Caterpillar Tractor Co., Peoria, Ill.

950 tons, buildings, Johns-Manville Corp., Los Angeles; Consolidated Steel Corp., Los Angeles, low.

900 tons, garage, department of sanitation, Bergens Landing, Queens, N. Y. Stock Construction Corp., New York,

898 tons, bridge, Dallas, Tex.

650 tons, coal bin, Wheeling Steel Corp., Wheeling, W. Va.

577 tons, piling, Tennessee valley authority, Chickamauga dam; bids Sept. 17.

454 tons, bridge, Galveston, Tex.

450 tons, Washington state bridges, Whitman and Pacific counties; bids at Olympia, Sept. 21.

450 tons, building, Glidden Co., Chicago.

430 tons, Oklahoma highway bridges; Mays and Dewey counties.

400 tons, Embassy building, apostolic delegation of Catholic church, Washington; bids Sept. 20.

350 tons, building, Aluminum Co. of America, Mobile, Ala.

340 tons, state highway grade separation, U. S. 25, Erie, Monroe county, Michigan.

325 tons, post office, Paducah, Ky., Algernon Boyer, Louisville, Ky., general contractor.

324 tons, Nasel river bridge, Pacific county, Washington; bids Sept. 21.

275 tons, office building, Wilmington, Del.; bids in.

240 tons, bridge, Adams county, Ohio; bids in.

230 tons, recreation center, Elmhurst, N. Y., United States treasury department.

214 tons, shapes, floor plates and stair treads, crusher building of construction plant, Hiwassee dam, Tennessee valley authority; bids Sept. 23.

200 tons, gymnasium, pool and bleachers, State Teachers college, Shippensburg, Pa.; bids Sept. 21.

165 tons, bridge, Hocking county, Ohio; A. J. Baltes, Norwalk, O., low.

135 tons, galvanized shapes, Norris switchyard extension, Tennessee valley authority; bids Sept. 21.

120 tons, bridge, Trumbull county, Ohio; Rice Bros., Belmont, O., low.

110 tons, bridge, Kittery, Me.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Bolt, nut and rivet demand has not shown major changes from the rate of recent weeks though consumption has continued fairly heavy. Farm implement and tractor manufacturers are maintaining their needs closer to the year's peak than most consumers. Railroad shops and freight car builders continue busy but the tendency in consumption is downward and fourth quarter requirements are expected to be definitely below the average for the year to date. Fourth quarter contracts are being issued with unchanged prices.

Reinforcing

Reinforcing Bar Prices, Page 89

Pittsburgh—Awards are headed by 4200 tons, including 2400 tons of rail steel, for sedimentation tanks at Detroit, awarded to Carroll-McCreary Co., New York, through Rosoff Bros., contractors. Bethlehem Steel Co. has secured 500 tons for the girls' dormitory building at State College, Pa.

Cleveland — Mill operations have held up well in face of the discouraging trend in the local reinforcing market. However, backlogs have been materially reduced so that considerable improvement must appear soon if operations among both fabricators and producers is to remain at current levels. Mill prices have held firm, although some shading is apparent on fabricated material.

Chicago—New business is insufficient to prevent a further decrease in backlogs. The outlook is moderately favorable, inquiries being fairly numerous but consisting generally of small lots. State road work, which has been quiet so far this year, is due for better activity, several inquiries being scheduled to appear within the next 30 days. Only a few large projects are pending.

Boston—Reinforcing steel awards are mostly in small lots with few outstanding inquiries. New work involves substantial tonnage for the Huntington avenue subway extension, Boston; 300 tons, bridge, Deer Isle, Me., and close to 800 tons for a bridge, Northampton, Mass. About 2000 tons are active with indications of a substantial improvement in new requirements shortly, although highway needs are expected

Concrete Awards Compared

	Tons
Week ended Sept. 11	**12,097**
Week ended Sept. 4	**8,539**
Week ended Aug. 28	**2,458**
This week, 1936	**3,827**
Weekly average, 1936	**6,005**
Weekly average, 1937	**6,456**
Weekly average, August	**9,495**
Total to date, 1936	**257,957**
Total to date, 1937	**238,987**

Includes awards of 100 tons or more.

CROSBY FOR STAMPINGS

ALL our efforts have been concentrated on one product—STAMPINGS—for 40 years. We have made stampings, deep, intricate, heavy, light, large and small, for nearly every branch of industry.

Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

to decline during the remainder of the year.

New York—With the exception of slightly more than 1000 tons for highways, mostly mesh, reinforcing steel contracts have slumped with new inquiry less promising. In the building field, 1350 tons for a treasury department structure, West Point, N. Y., is outstanding.

Philadelphia—State work now becoming active will take fair tonnage, but private work is confined to relatively small number of alteration and addition jobs involving less than 100 tons individually. Fabricators are disappointed with current volume and blame rising costs and general business uncertainties.

San Francisco—Reinforcing market was active and 2414 tons were placed, bringing the aggregate for the year to 71,999 tons, as compared with 176,110 tons in 1936. Among the awards were 850 tons for the Vignes crossing in Los Angeles, booked by Ceco Steel Products Co., Los Angeles. Pending business does not exceed 6000 ton and the largest project calls for 775 tons for the Mare Island drydock, Calif.

Seattle—Prospects for fourth quarter are improved with projected WPA jobs in the Pacific Northwest. Meanwhile the volume of small tonnages is increasing. Awards included 250 tons to Bethlehem Steel Co., Seattle, for two state highway contracts and a local warehouse building. Reclamation bureau will open bids at Yakima Sept. 22 for the Roza irrigation projects, calling for 1250 tons.

Reinforcing Steel Awards

4200 tons, including 2400 tons of rail steel, sedimentation tanks, Detroit, to Carroll-McCreary Co., New York.

1325 tons, bullion depository, West Point, N. Y., to Ceco Steel Products Co., New York; through Boudin Contracting Co., New York.

850 tons, Vignes crossing, Los Angeles, to Ceco Steel Products Corp., Los Angeles.

800 tons, two sections, Merritt parkway, Stamford and Greenwich, Conn., to American Steel & Wire Co., New York; through New Haven Roads Construction Co., New Haven, Conn.

500 tons, girls' dormitory building, Pennsylvania State college, State College, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

454 tons, bureau of reclamation, invitations Cantu, Phoenix and Potholes Calif., to Colorado Fuel & Iron Co., Pueblo, Colo.

375 tons, mesh and bars, mostly former, state highway project, Southern parkway Queens, N. Y., to Concrete Steel Co., New York; A. W. Banko, Inc., Hastings-on-Hudson, N. Y., general contractor, opening of Aug. 17, Albany.

360 tons, malt house, Kurth Malting Co., Milwaukee, to Joseph T. Ryerson & Son Inc., Chicago.

280 tons, building, Dodge Bros., Detroit, to Bethlehem Steel Co., Bethlehem, Pa.

260 tons, building, Wisconsin Malting Co., Manitowoc, Wis., to Laclede Steel Co., St. Louis.

250 tons, flour storage building, Washburn-Crosby Co., Buffalo, to Buffalo Steel Co., Tonawanda, N. Y.

250 tons, building, International Harvester Co., Indianapolis, divided between Hugh J. Baker and Laclede Steel Co., St. Louis.

250 tons, two state highway projects and Seattle warehouse, to Bethlehem Steel Co., Seattle.

250 tons, state road, Fulton, New York, to Bethlehem Steel Co., Bethlehem, Pa.

235 tons, mostly mesh, state highway project RC 3904, Oswego county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Warren Bros. Roads Co., Utica, N. Y., general contractor.

218 tons, bureau of reclamation, invitation B-33,305-A, Moxee City, Wash., to Knoxville Iron Co., Knoxville, Tenn.

152 tons, bureau of reclamation, invitation A-42,337-A, Knob, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, mesh highway, Oneida county, New York, to Wickwire Spencer Steel Co., New York; through Dale Engineering Co., Utica, N. Y.

150 tons, sewer and service conduits, PWA project 1034-R, Buffalo, to Bethlehem Steel Co., Bethlehem, Pa.

148 tons, mausoleum, Holy Cross cemetery, San Francisco, to Colorado Fuel & Iron Co., Pueblo, Colo.

130 tons, bridges, Central Railroad of New Jersey, Elizabeth, N. J., to Bethlehem Steel Co., Bethlehem, Pa; through Franklin Contracting Co., Westfield, N. J.

110 tons, Scajaquada creek, Buffalo, to Joseph T. Ryerson & Son Co. Inc., Chicago.

100 tons, state prison, Michigan City, Ind., divided between Hugh J. Baker and Joseph T. Ryerson & Son Inc., Chicago.

100 tons, addition, Claus Spreckles building, San Francisco, to Soule Steel Co., San Francisco.

100 tons, Bear Creek bridge, Franklin county, Idaho., to unnamed interest.

100 tons, state overcrossing Coos county, Oregon, to unstated interest.

Reinforcing Steel Pending

2000 tons, estimated, sewers, contracts 2 and 3, project 2, Queens, N. Y.; bids Sept. 20.

1250 tons, Rosa canal lining and structures; bids to reclamation bureau, Yakima, Wash., Sept. 22.

538 tons, Federal court house, Kansas City, Mo., Swenson Construction Co., Kansas City, Mo., low.

485 tons, foundations and substructure, Northern boulevard grade separation and Flushing river bridge on Queens approach to Bronx-Whitestone bridge, Queens, N. Y., National Excavation Corp., New York, low.

400 tons, Pabst elevator, Milwaukee.

242 tons, bureau of reclamation, invitations 24,584-A and 24,582-A, Potholes, Calif.; bids opened.

225 tons, social science building, University of Minnesota.

220 tons, Black Canyon project, Emmet, Idaho; bids to reclamation bureau, Boise, Idaho, Sept. 20.

200 tons, coaling station, Hastings, Nebr., for Chicago, Burlington & Quincy railroad.

200 tons, Tuberculosis hospital, Franklin county, Ohio.

197 tons, post office, Paducah, Ky., Algernon Boyer, Louisville, Ky., general contractor.

180 tons, officer quarters, government air depot, Sacramento, Calif.; bids again postponed from Sept. 10 to Sept. 21.

175 tons, laboratory, Shell Development Co., Emeryville, Calif.; Lindgren & Swinerton, San Francisco, general contractor.

175 tons, Embassy building, apostolic delegation of Catholic church, Washington; bids Sept. 20.

139 tons, two state bridges, Marin county, California; bids Sept. 22.

120 tons, Seattle light department switchboard building; A. S. Hansen, Seattle, general contractor.

100 tons, gymnasium, pool and bleachers, State Teachers college, Shippensburg, Pa.; bids Sept. 21.

100 tons, S. W. works, division H-H, Chicago Sanitary district, Chicago.

HANDS ARE FREE *for other work*

Hannifin foot operated Air Control Valves simplify control of air operated equipment, leaving operator's hands free. Simple, dependable disc-type valve design gives positive control, prevents the leakage that wastes air power. No packing, and no packing maintenance troubles.

Made in 3-way and 4-way types, hand and foot operated, manifold, spring return, electric, and special types. Write for Valve Bulletin 34-S.

Heavy duty rotary ratchet valve, one pressure operates cylinder, second pressure reverses cylinder.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue, Chicago, Illinois

ENGINEERS • DESIGNERS • MANUFACTURERS • *Pneumatic and Hydraulic Production Tool Equipment*

HANNIFIN *"Packless"* AIR CONTROL VALVES

Pig Iron

Pig Iron Prices, Page 90

Pittsburgh—Pig iron producers report a large percentage of fourth-quarter contracts already signed. Some consumers, however, may hold off and buy only as they need iron, unless developments make precautions advisable. Buyers whose stocks have dwindled are now reordering and this is helping to keep the movement more even. Others have been keeping stocks at an adequate level and will continue this practice into fourth quarter. From present indications it appears September shipments will be reasonably close to August.

Cleveland—Shipments during September are expected to equal August, as most sellers have considerable tonnage on books for third quarter delivery. To date only a few foundries have asked that some of the tonnage bought for this quarter be extended into fourth quarter. Foundries are fairly well stocked and as a result are ordering only for spot delivery. Rumors persist of a $1 advance before the year is out.

Chicago—Pig iron shipments show a slight gain over deliveries a month ago though consumption is slow to increase and improvement in production of automotive castings is below expectations. Foundry schedules still are relatively heavy for this period and are counted on for further gains during the next several weeks. Most consumers now have covered requirements for the balance of the year and producers are comfortably booked to maintain heavy deliveries through fourth quarter. The market is firm at $24, furnace, for No. 2 foundry and malleable.

Boston—With consumers taking full third-quarter contract tonnage, the bulk having been shipped or released for delivery, new buying is slack with fourth-quarter covering yet to develop in volume. Although some of the larger users have heavy stocks, most consumers in this class have indicated they will purchase close to estimated fourth quarter needs and maintain stocks close to present tonnage. Export volume continues as a welcome fill-in factor, 1800 tons having been booked for Sweden and China, 1000 tons additional for the former having been shipped by the Everett furnace.

Philadelphia—Current buying is light, in lots of 100 to 200 tons. Consumers are well covered through September and revived buying is not expected until October. Meanwhile foundry operations continue steady and shipments against contracts have been excellent. Some interests report August shipments exceeded those of July and September is running ahead of August. Prospects for a fourth quarter advance depends on the extent of the fall upturn and export demand. The latter is moderate at present. One blast furnace may go down shortly for repairs.

New York—Pig iron business shows a slight improvement. Fourth quarter contracting is becoming somewhat more general and there is a gain in spot orders for fill-in needs. However, sellers see no marked improvement before the latter part of the month.

Buffalo—Shipments continue fair. Slight decline from capacity operations is noted. Fall business prospects lean toward the bullish side. Current business continues of a highly miscellaneous character.

Cincinnati—Fourth quarter contracts for pig iron are being taken steadily although considerable tonnage remains to be placed, as some melters prefer to delay until further clarification of requirements. Stocks are low and shipments have exceeded the recent melt, which is off, except for agricultural and stove castings. Spot business is inactive.

St. Louis — New business has slowed and melters are marking time. Spot buying, mainly by the smaller melters who usually do not make large contract commitments, has been in fair volume. Some contracting for fourth quarter is reported, but the total is not impressive. Following Labor day the melt has picked up noticeably, and cooler weather has permitted higher efficiency at plants, particularly stove and jobbing foundries.

Shipments are holding at about the average August rate. Total August shipments were slightly above July, and represented the largest August total since the predepression era.

Birmingham, Ala. — Melters report the pig iron market as strong with no appreciable decline in demand. Except for the furnace taken out last week by the Tennessee Coal, Iron & Railroad Co. at Fairfield, operations continue on the same schedule, 17 blast furnaces being in operation. Prospects for fall business are described as bright.

Ferroalloys

Ferroallay Prices, Page 90

New York—Ferromanganese prices have been reaffirmed on contracts

Sixtieth GRANT YEAR 1877-1937

Between the high speed motor and the slower running machines Grant Worm Gear Speed Reducers form the logical link.

Built for faithful performance are Grant Reducers, in various types to meet specific application.

GRANT GEAR WORKS—Boston

for fourth quarter at $102.50, duty paid. Domestic spiegeleisen, ferrochrome and ferrosilicon also have been reaffirmed on contracts. Shipments are well sustained.

Scrap

Scrap Prices, Page 92

New York—An additional heavy tonnage of steel scrap for export, unofficially estimated at 250,000 tons, has been closed by the European cartel with broker-exporters in this country. Four companies are reported sharing in the contract. In some quarters this tonnage is considered as an extension of orders placed by the cartel in June, but on more favorable terms, of about $2 per ton higher than prices paid for heavy melting steel at that time. The rumor here is that $21, boat, will be paid for No. 1 and $20 for No. 2 but this has not been confirmed.

Domestic buying is light with numerous mills holding up shipments. Meanwhile, prices on several grades are easier for domestic shipment. There also is a weaker tendency for heavy melting steel for dock delivery. Some brokers have dropped bids for heavy melting steel for dock delivery by 50 cents per ton, to $16.50 and $15.50, although one broker is still paying for a time at least $17.

Pittsburgh—No. 1 heavy melting steel is off 50 cents to $20.50 to $21 per ton, based upon dealer purchases and offerings to mills in the latter part of the week. Mills continue out of the market. Railroad specialties, billet crops, blast furnace and other grades are down sharply. Some of the steel on the Pennsylvania railroad list brought $22.25, which was about $1 under the price at the start of August.

Cleveland—Except for small shipments on contracts there is no movement in steel and iron scrap and buying is practically at a standstill. Supplies are not large and are closely held. Some embargoes are still in force in the Youngstown district. Quotations are nominal and weak in absence of buying.

Chicago—Scrap is easier and with consumers showing little interest in making new commitments, prices of a number of grades have declined further. Heavy melting steel is off 50 cents at $18 to $18.50, with sellers picking up this grade at the lower figure. Shipments against old orders are steady.

Boston—To fill cargoes for ships arriving for scrap requiring approximately 20,000 tons in the last week or ten days, brokers have raised prices on several grades for dock delivery. While $18.50 is still being paid for No. 1 heavy melting steel, considerable tonnage has brought $19, dock, while $18 is frequently paid for No. 2. No. 2 cast for export is also stronger. Heavier demand for cast grades by district foundries has also strengthened prices for New England delivery, reflected in quotations for Eastern Pennsylvania which are also firmer. While most of the lighter grades of scrap are inactive, the market has a stronger tone, stove plate for domestic shipment being an exception.

Several brokers lowered their bids on No. 1 heavy melting steel for dock delivery to $18 per ton late last week, after the price had gone to $19 to bring out material for export. The price for No. 2 was lowered to $17, dock.

Philadelphia—The scrap market shows further weakening, with several grades down 50 cents. The current weakness reflects slow demand for steel products and the tendency of large buyers of scrap to remain out of the market. Supplies of No. 1 heavy melting steel are not plentiful although the price has declined 50 cents. No. 2 is in more liberal supply and is off an additional 50 cents. Railroad specialties are relatively scarce and prices are well maintained.

Buffalo—A weak tone prevails in scrap with prices tending lower. No actual tonnage sales have been reported during the last two weeks, with the leading consumer out of the market. A break of 50 cents was shown in a nominal quotation by most sellers as No. 1 heavy melting scrap steel was quoted at $19.50 to $20, with No. 2 at $17.50 to $18. Consumers were said to have a fairly substantial stock with tonnage via the lakes of moderate proportions.

Detroit—Reflecting continuation of current weakness, and with additional pressure from a sagging stock market, scrap prices are off again from 25 to 50 cents a ton. Light tonnages were closed this week and in all cases brought lower bids.

Despite the easiness, dealers are not inclined to become bearish over the outlook. They believe resumption of automobile production shortly will carry the market back to higher ground.

Cincinnati—Heavy melting steel is off $1 from previous quotations, with dealers' offering prices also lower on other grades. One mill, recently taking tonnage from this district, was reported out of the market, which depress quotations here.

St. Louis—Further weakness has developed in iron and steel scrap and purchasing by all classes of users is hesitant and in smaller volume than for a number of weeks. Confidence among melters is less conspicuous than heretofore, and there is a disposition to await developments before enlarging commitments. The most vulnerable grade has been sheet clippings, bundled and compressed sheets, which are down from $1 to $2 per ton.

Birmingham, Ala. — Prices of No. 1 and No. 2 heavy melting have eased off $1 a ton, due to a market described as considerably more inactive over the past two weeks. While considerable tonnage contin-

NEW-BETTER

HOMMELAYA PROCESS

of

Vitreous Enameling

The greatest development in the Porcelain Enameling industry in the past century is here—proved—accepted.

1) **Produces a perfect Porcelain Enamel finish with only ONE coat and ONE fire!**
2) **Cuts enameling costs by one-third!**
3) **Reduces possible chipping to an absolute minimum!**
4) **Produces a BETTER finish in ONE coat than regular enamel in two coats!**
5) **Ware may be finished in any color desired!**

Write us TODAY and learn more about this NEW, BETTER, INEXPENSIVE method of Porcelain Enameling.

THE O. HOMMEL COMPANY

209 FOURTH AVENUE, PITTSBURGH, PA. • NEW YORK OFFICE
421 SEVENTH AVENUE • FACTORY, CARNEGIE, PENNSYLVANIA

ues to move to foreign countries, most of it is on previous contracts. Republic Steel Corp., the largest buyer, is temporarily out of the market and probably will not make additional purchases before the latter part of the month. Dealers are more inclined to turn their stock over than they were a few weeks ago.

Seattle — The market is dormant. Export business is at a standstill. Old commitments have practically all been forwarded to Japan and shipment to Chinese ports is impossible. Local mills are fully stocked and have withdrawn. Some sales are being made to foundries but the total volume is small.

Warehouse

Warehouse Prices, Page 91

Cleveland — Some warehouse distributors report order volume and aggregate tonnage declined as much as 20 per cent in August from July. However, the recession has eased considerably since the first of the month and in some instances has improved over the corresponding period in August. Most distributors have replenished their depleted stocks over the last 30 days and are now awaiting anticipated general revival in fall activity.

Chicago—Despite interruption of the holiday period, sales continue in relatively large volume. Warehouses anticipate the usual fall upturn in demand around the latter half of this month. Prices are steady.

Philadelphia — Leading interests note a further slight increase in buying, some of which represents preliminary requirements of usually large steel consumers and is taken to indicate the first signs of fall revival. Buying, however, is well below the levels of early summer.

Cincinnati—Prices on warehouse items were extended into September and likely will be unchanged for fourth quarter. An expected upturn in volume, over the disappointing August levels, has not yet appeared.

St. Louis—Labor Day was preceded by a lag in buying from warehouse and the past several days have witnessed no improvement. Total August volume fell slightly below July, but was the largest for any August since 1930. Operators report customers are worried by war uncertainties abroad and labor unrest at home and are purchasing mainly on a necessity basis. An exception has been wire and wire products for distribution in the rural areas. All oil country goods, particularly tubular materials, are active. A fair volume of boiler tubing and furnace repair materials has been taken. Railroad buying is less in evidence than a few weeks back.

Seattle—Small tonnages predominate but total volume has been satisfactory . Sheets are in best demand while bars, plates and tubes are moving in larger lots. Deliveries are normal and stocks complete. Carlot buying is the exception. Prices are firm. Effective Sept. 13, an increase on seamless boiler tubes will apply on the Pacific Coast, all houses having agreed to uniform prices.

Iron Ore

Iron Ore Prices, Page 92

New York—Domestic scheelite has been purchased here for delivery over the next three months at the equivalent of $25, duty paid, per short ton unit. Hostilities in China, with a subsequent lack of firm offerings on any sizable amounts of Chinese wolframite, continue to disturb the situation, but the price done recently on scheelite is still much less than is being reported in some quarters as the nominal market.

The ore trade in general, however, is not inclined to become too excited. Any general tieup in commercial shipping in the Mediterranean would imply a further spread of hostilities involving leading European powers. This is a development the trade hesitates to entertain too seriously. In fact, some are highly hopeful, despite certain disconcerting aspects, that the conference will result in a peaceful settlement which will actually improve conditions over those existing in recent weeks.

Chinese wolframite has been quoted at London at prices in excess of the equivalent of $35 duty paid per short ton unit here. However, these prices are regarded by sellers here as of little real significance in view of the small, speculative lots involved.

Leading sellers of tungsten ore are making every effort to avert a runaway market, which might prove especially harmful should a later clarification of conditions prove it to be unwarranted.

Indian and Transvaal chrome ore has been marked higher, largely on the strength of increasingly higher freight rates, both actual and in prospect, and to continued strong demand abroad. Indian, 48 to 50 per cent, is now holding nominally at around $26 to $27, c.i.f. and Transvaal, 45 per cent, nominally $21. The spread on Turkish chrome ore prices is unchanged, although the outside figures are more representative, with some sales having recently been made here on the basis of these prices.

The increasingly tense situation in the Mediterranean area with the state department cautioning American shippers, although not definitely advising them to stay out of the Mediterranean waters, has added potential strength to ores from Turkey, Russia and North Africa. A tie-up of commercial shipping would send the price on these ores soaring, some interests declare.

SHEPARD NILES
THE NEW
LIFT ABOUT
THE MODERN ELECTRIC HOIST
Anti-Friction Bearings Throughout
WRITE FOR BULLETIN No. 126
SHEPARD NILES CRANE & HOIST CORP.
358 SCHUYLER AVENUE, MONTOUR FALLS, N. Y.
A Complete Line of Cranes and Hoists

Indian ores would not be so greatly affected, for while shipments through the Mediterranean would be cut off there are the other routes around the Horn or across the Pacific and through the Panama canal. As a matter of fact, some importers have been using these routes from India for many months.

North African low phosphorus ore for delivery next year at 20 cents, c.i.f., as quoted by one leading interest, is still regarded by most buyers here as too high. However, a heavy demand continues on the other side and the seller at this price has apparently no intention of revising his figure, especially in the light of recent developments in the Mediterranean area.

The strength of ore demand abroad has renewed speculation as to possibility of American ores being exported to Europe. However, it appears that the Lake Superior ores are the only ones that might prove of special interest to foreign buyers and these ores are too far removed from the seaboard to make transactions profitable at present, according to some traders who have recently gone into this situation rather extensively.

Metallurgical Coke

Coke Prices, Page 89

The leading steel producer in the Pittsburgh district has resumed taking coke shipments on a reduced schedule from the Connellsville, Pa., region. Spot demand remains light, a condition which may continue until domestic demand for coke and coal becomes stronger with the advent of winter. Attention of coke, coal, and blast furnace operators has centered on the new Guffey law prices, which probably will be announced in October. It is generally believed that an advance in prices will be made.

Jones & Laughlin Steel Corp., Pittsburgh, is constructing a large coal cleaning plant at its Shannopin mine on the Monongahela river. The plant was designed and fabricated by Heyl & Patterson, while the foundations are being placed by the Enterprise Contracting Co. The plant will have a capacity of 6000 tons per day.

Steel In Europe

Foreign Steel Prices, Page 91

London—(*By Cable*)—Steelworks in Great Britain are pressing for supplies of pig iron, which again is becoming scarce. Output is sold to the end of the year, leaving only limited tonnage for export purposes. Steel demand is undiminished and deliveries now extend into 1938 at the price then prevailing. South Africa has placed a locomotive and some sheet piling contracts.

The Continent reports export demand quiet. Light sheets and galvanized sheets are weak. Steelworks are busy with an accumulation of orders. A revival in buying is looked for toward the end of September.

Heading Specialists
Special screws of great variety made to order
Quality rivets and studs from all grades of materials to order only for other manufacturers.
Progressive Manufactured Products are made on both a quality and price basis, their uniformity of construction insures you against slowing down in your assembly operation.
Manufacturers learn to admire business concerns for what they are and what they do, a great many parts now made on screw machines lend themselves to heading which results in great savings and improved service. Have our specialists consult with you, our service is free and we might suggest something that may prove of considerable importance to you.
THE PROGRESSIVE MFG. COMPANY
Torrington, Conn., U. S. A.
IN STOCK AT ALL TIMES — Standard Machine Screws— Machine Screw Nuts — Interchangeable bolts and nuts made strictly to A.S.M.E. tolerances
THE PROGRESSIVE MFG. CO.
QUALITY
PROMCO
BRAND
TORRINGTON, CONN. U.S.A.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh—With the approach of Sept. 30, tin plate producers are endeavoring to roll and ship the remaining contract plate. In order to accomplish this, rollings have been expedited as much as possible recently. Meanwhile, bookings for fourth quarter continue fair and export inquiry is good. Operations are well above 100 per cent.

New York—Tin plate sellers are pushing production schedules to the limit, but it appears that most will not be able to work off their long-term contracts completely before the scheduled expiration date, Sept. 30. This is particularly true of producers who late last spring were handicapped by labor strikes. It would not prove surprising if shipments should go through well into the end of next month. Meanwhile heavy demand is noted from South America and Europe, for December to February shipment. While there are some variations, export prices continue about at a parity with the domestic market. Interestingly, tin plate demand from the Orient is quiet.

Chrome Ore Imports Up

Philadelphia—Exceptionally heavy imports of chrome ore through this port are noted for the week ended Sept. 4, 2850 tons arriving from the Philippine Islands, 489 from Portugese Africa and 3289 tons from South Africa. Five hundred tons of iron ore also were brought in from Persia.

Other imports included 22 tons of steel tubes, 51 tons of sponge iron, 37 tons of wire rods, 19 tons of steel forgings and 21 tons of steel bars from Sweden; 76 tons of structurals and 3 tons of steel bands from Belgium and 1233 tons of pig iron from British India.

Ore Imports Steady

Baltimore—A heavy tonnage of foreign ore continues to arrive here. From Aug. 14 to Sept. 2, inclusive, iron ore arrivals were as follows: 21,500 tons, Cruz Grande, Chile, Aug. 14; 6601 tons, Lulea, Aug. 15; 22,300 tons, Cruz Grande, Aug. 18; 6500 tons, Daiquiri, Cuba, Aug. 20; 7233 tons, Narvik, Sweden, Aug. 29; 21,500 tons, Cruz Grande, Aug. 29; 5700 tons, Felton, Cuba, Aug. 31; and 22,500 tons, Cruz Grande, Aug. 31.

Chrome ore arrivals included 4000 tons from Masinloc, Zabales, Aug. 14; 808 tons, Beira, Aug. 14; 1100 tons, Aghis Marina, Aug. 16; 2000

tons, Fethiye, Turkey, Aug. 27; and 1016 tons, Fathich, Aug. 28.

Manganese ore shipments comprised 2000 tons from Durban, Aug. 14; 3400 tons, Poti, Russia, Aug. 14; 7600 tons, Rio de Janeiro, Brazil, Aug. 17; 1500 tons, Calcutta, India, Aug. 21; 1850 tons, Poti, Russia, Aug. 25; 6800 tons, Poti, Russia, Aug. 27; 9200 tons, Poti, Russia, Aug. 28; 1000 tons, Calcutta, Aug. 29; and 1500 tons, Calcutta, Sept. 2.

Shipment of 17,356 bags of magnesite was received from Trieste, Italy, Aug. 29.

Mirrors of Motordom

(*Concluded from Page* 28)

at each location. Martin charged Michigan state legislators with being "nincompoops living off what they got from the chambers of commerce and industry."

Over 300 marchers in the parade professed to be members of the UAW Ford local, wore masks over their faces, signs stating, "If we unmask now, we will be fired."

Nine women who lost their jobs when Yale & Towne Mfg. Co. closed its plant here last May because of labor trouble, besieged Homer Martin at his office demanding he bring the company back to Detroit or get them jobs. The company is not likely to return here, for the plant has been taken over by Detroit Macoid Corp., producer of molded plastic. Martin disclaimed any responsibility for the situation, saying the employes staged a sitdown strike and then called on the UAW to assist them. The company employed 375 at the time.

A further gage of membership interest in the UAW was the recent boxing exhibition staged by the union at which only 300-odd appeared. Inasmuch as this attendance did not begin to cover expenses, the event was postponed. At a later date only about 3000 showed up, despite the fact the show offered some better than average fighters. Apparently a high percentage of Mr. Martin's professed 375,000 adherents is not much interested in the organization's extracurricular activities.

CHEVROLET reports new car and truck sales for August a record high at 99,337 units, eclipsing even August of 1929. Of the total, 22,120 were trucks.

Pontiac customer relations department quizzes new owners by mail to learn reactions, receives answers from over 20 per cent.

Up to the end of August, Hudson had consumed about 74,000 gallons of black lacquer for finishes, as against 65,000 gallons of gun-metal gray, nearest color rival.

About 60 per cent of the Ford V-8 engines produced are equipped with aluminum cylinder heads, the balance cast iron. Aluminum heads are used on assemblies outside the Detroit area, for economy in shipping.

Reader Comments

(*Concluded from Page* 11)

steel business must, of course, be able to keep abreast of the fast changing conditions. Operations have many technical aspects and it is here the properly trained college boy has an initial advantage over the untrained boy.

In our opinion, young men who are not able to go to college will find their burdens increasing in future years and they have a definite challenge to meet and it simply means that they must continue their education and not let it stop, as so many of them have done in the past. If they are going to succeed, they must apply themselves more diligently to their jobs and support this effort by outside education. This means that the boys will find it necessary to go to night schools and continually school themselves.

Many of these high school boys will excel because they realize their shortcomings and are constantly being prodded to get ahead. The door is open to boys having all types and all grades of educational backgrounds. We must not forget that it is the individual who really in the end spells the difference between success and failure.

F. H. RAMAGE
Sales Promotion Manager,
Republic Steel Corp.,
Cleveland.

Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York—While tension in the Mediterranean and Far East strengthened prices and stimulated sales in the foreign metal markets last week, successive breaks in security values tended to slow up buying in the domestic market. The display of strength in and active demand for tin was a notable exception. Louis S. Cates, president of Phelps Dodge Corp., and F. H. Brownell, chairman of American Smelting & Refining Co., stated that consumption of metals in Europe is holding up well and due in a large measure to other than armament needs.

Copper—Export copper fluctuated widely and closed at 13.75c, c.i.f. European ports. Electrolytic held firm here at 14.00c, Connecticut, on light sales.

Lead—Prices continued steady at 6.35c, East St. Louis, and 6.50c, New York. Needs for September have been covered rather fully while those for October are about 30 per cent covered. The statistical position of the market continued to improve.

Zinc—Interest again was centered on the tightness of supplies with total stocks at the end of August amounting to only 11,227 tons, a new low for recent years. Importations are relieving the stringency somewhat. Prime western held at 7.25c, East St. Louis.

Tin—Sales were consistently good and prices moved upward. Straits spot closed around 59.50c.

Antimony — Inquiry continued light with spot prices holding unchanged at 15.75c, New York, for American and nominally 17.50c, duty paid New York, for Chinese metal.

IF YOU WANT ACTION—CALL FOR ERDLE!

These days call for speed. And that's what we like!

We're perforating sheets—and plenty of 'em, but are they *Yours?* If they aren't, you have a treat coming. A treat to service—and a treat to quality. All it takes is one little inquiry, and then, Sir—things happen.

Steel, Tin, Aluminum, Brass, Zinc, or Copper are the metals—in practically any size or type of perforation.

58 Years in Business

ERDLE PERFORATING CO.
71 York St. Rochester, N. Y.

Reed-Prentice Corp. Marks Sixty Five Active Years

Reed-Prentice Corp., Worcester, Mass., is marking the sixty-fifth anniversary of its founding in 1872 as A. F. Prentice & Co., manufacturer of lathes and drilling machines. By purchases in 1875 and 1877 F. E. Reed took over the company and changed its name to F. E. Reed Co. Albert F. and Vernon F. Prentice then formed Prentice Bros., which was merged with F. E. Reed Co. in 1912 to form the present company. The Reed company had devoted its entire attention to lathes and the Prentice company principally to drills, in 1905 developing the first geared head lathe.

In 1922 the Reed-Prentice Corp. absorbed the Whitcomb-Blaisdell Tool Co., Worcester, Mass., and the Becker Milling Machine Co., Hyde Park, Boston. One of the branches of the former was founded in 1837 and another in 1849. The Becker organization was founded in 1890 at Fitchburg, Mass., and placed on the market its milling machine, later moving to Hyde Park. Thus, through the companies absorbed by the Reed-Prentice Corp. its roots go back deeply into the machine tool industry of New England.

Briggs Mfg. Co. Adopts New Policy on Prices

Complete revision of price structure and a change in shipping policy has been announced by the plumbingware division of Briggs Mfg. Co., Detroit.

The announcement was made with the introduction of a new line of moderately-priced plumbingware which will augment the existing line. The new, readjusted price schedule, effective Aug. 15, establishes a uniform price for all points throughout the country. The trade price list is subject to freight allowance at mixed carload rate on all shipments weighing 200 pounds or more. Previously all Briggs fixtures were priced f.o.b. Detroit.

Briggs will continue to market its plumbingware exclusively through wholesalers and master plumbers, with all units carrying the plumbing fixture industry's regular guarantee.

Louisiana Span To Take 37,000 Tons of Steel

Construction of a $8,360,528 bridge across the Mississippi river near Baton Rouge, La., started recently, will require 37,000 tons of steel. This includes 2000 tons reinforcing bars.

Plans call for a bridge 65 feet above the 1937 maximum high water level with two cantilever spans, each with a horizontal clearance of 848 feet. Bridge will have a single-track railroad and two 18-foot roadways. Mainstructure will be 3326 feet and the approaches will be 8900 feet long, a total length of 12,226 feet.

Kansas City Bridge Co. will build the six piers upon which the main structure will be erected by the Bethlehem Steel Co.

Republic Develops Triple Drain Channel Roofing

A new roofing product has been developed by Republic Steel Corp. and is being introduced as "perfected triple drain channel roofing."

In each unit are four ridges and three valleys, providing three drainage channels instead of the conventional one or two. Because of this, it is stated, neither driving rain nor capillary attraction can cause leaks.

A beaded channel makes a tight fit at the overlapping edge, creating a vacuum action. Any rain passing this point is carried into the center channel through gravity.

The proper area for nailing is indicated clearly by the blue lines on each sheet. It is available in three types of metal, steel, copper-bearing steel, and rust-resisting Toncan iron. It is furnished in 26, 28 or 29-gage, in lengths ranging from 5 to 12 feet with a covering width of 24 inches.

GE Sponsors Course In Industrial Heating

More than 100 power salesmen from leading electric-service companies in various parts of the country will gather in Schenectady, N. Y., Sept. 20, for a five-day course, sponsored by General Electric Co., in industrial heating practices and applications.

During the sessions, attention will be focused not only on new types of equipment available and new developments in the art, but on potential markets for industrial heating as well. Factory trips, for the purpose of demonstrating modern heat-treating equipment at work, are planned for General Electric's Schenectady and Pittsfield plants.

Germany Limits Use of Iron, Steel in Building

Acute shortage of iron, steel and wood in Germany has caused the reich building inspection department to limit use of these materials for building to cases of extreme ne-

cessity. Stone or concrete may be substituted for all construction.

Steel cross beams may be used only in cellars where brick pillars are erected. Wood may be used for roofing. Railings, showcases, flag poles and feed troughs must be built of "other materials."

All supplies of iron and steel now in the hands of private individuals or corporations are required to be reported in detail to authorities.

Metal Doors, Window Sash, Frames Output Increased

Manufacturers of metal doors, door and window frames, window sash and shutters reported substantial increases in production and employment in 1935 over 1933, a recent census report shows.

Wage earners employed in this industry in 1935 totaled 4525, an increase of 26.7 per cent over 3572 reported for 1933, and their wages, $5,093,031, exceeded the 1933 figure, $3,123,156, by 63.1 per cent. Total value, at f.o.b. factory prices, of all products made in the industry in 1935 amounted to $22,740,129, an increase of 70 per cent as compared with the corresponding 1933 figure, $13,376,591.

Equipment

Chicago—Most manufacturers of machinery and plant equipment continue well occupied on orders and while new business is less active than earlier in the year, heavy production is in prospect for the coming quarter. Machine tool inquiries show occasional gains but sales still are lighter than during midyear. This month is counted on for recovery in demand, the vacation season recently having postponed closing on some business. The farm equipment industry's expansion program is developing some inquiries and orders. Railroads continue inactive.

Pittsburgh—United States engineers of the Rock Island district will open bids Sept. 24 for construction and delivery of four locomotive cranes for locks and dams Nos. 12, 13, 21 and 22, upper Mississippi river. Delivery is to be made to Bellevue, Iowa, April 15, 1938; to Fulton, Ill., May 1, 1938; to Quincy, Ill., within 60 days after the contract is placed, and to Saverton, Mo., May 15, 1938.

Seattle—The Sino-Japanese war and labor troubles have affected the logging and lumber industries which practically have ceased buying. However, electrical equipment, road building machinery and items needed in waterworks construction are in good demand.

Construction and Enterprise

Ohio

ATHENS, O.—City has plans for generator unit and auxiliaries for municipal plant, costing about $90,000.

CLEVELAND—Standard Oil Co. of Ohio, Midland Bank building, has authorized laying of welded steel pipe line from Latonia to Cheviot, where improvements will be made, including steel tanks and pumping machinery. Cost over $200,000.

CLEVELAND — Wellman Bronze & Aluminum Co., 6017 Superior avenue, will install electric power equipment in the new addition it is erecting to its bronze bearing and bushing manufacturing plant. Work will begin soon.

COLUMBUS, O.—State department of public welfare will soon let contract for 300-kilowatt engine generator unit and auxiliaries for power house at state hospital.

NAPOLEON, O.—City plans addition to municipal power plant, including boiler unit and auxiliary equipment. Estimated cost $30,000. Froehlich & Emery Engineering Co., Second National Bank building, Toledo, O., consulting engineer.

NELSONVILLE, O.—City plans improvements in municipal power plant which will cost approximately $90,000.

Connecticut

NEW BRITAIN, CONN. — Landers, Frary & Clark Inc., maker of electric heating and cooking appliances, has approved plans for new boiler house, with installation to include boiler unit and accessories. Estimated cost $200,000. (Noted STEEL, Aug. 23).

NEW HAVEN, CONN. — Pond Lily Co., Whalley avenue, plans installation of power equipment in new addition to its textile dyeing and finishing plant. Cost $80,000, with machinery.

New York

BROOKLYN, N. Y.—G. C. Cooper Mfg. Co., 347 Troutman street, is considering making factory alterations, cost of which is estimated at $40,000, with equipment.

NEW YORK—Horni Signal Mfg. Co., 515 Greenwich street, plans to make improvements to its plant and add new equipment.

New Jersey

LINDEN, N. J.—Mather Spring Co., Toledo, O., plans installation of electric power equipment in new branch plant here where large tract of land has been acquired for manufacture of steel springs and automobiles.

Pennsylvania

AMBLER, PA. — Keasby & Mattison Co., manufacturer of asbestos and magnesia products, is building a plant here for fabricating asbestos-cement pressure pipe. A second plant to cost $500,000 will go into construction shortly at St. Louis.

SCOTTDALE, PA.—United States Cast Iron Pipe & Foundry Co. plant here has been purchased by Sterling H. Bonsall, Beverly, N. J. The plant is now being operated as the Duraloy Co. to manufacture a special steel alloy.

Michigan

DETROIT—Standard Tube Co., 14534 Woodward avenue, is contemplating erection of two-story plant addition, costing about $50,000.

DETROIT—Chrysler Corp., 341 Massachusetts avenue, will install motors

More Shearing Between Grinds
The only yardstick for measuring shear knife quality is the amount of tonnage each knife will yield before grinding becomes necessary. And in this regard, you will find AMERICAN shear knives to be unsurpassed... as numerous plant shopmen are daily experiencing in constant production.
AMERICAN SHEAR KNIFE CO.
HOMESTEAD PENNSYLVANIA

and controls, regulators, transformers, conveyors, electric hoists and other equipment in its new multi-unit plant for production of small motor trucks. Estimated cost over $700,000. Albert Kahn Inc., New Center building, is architect and engineer.

LANSING, MICH.—City council has plans nearing completion for large multi-story addition to municipal electric power plant, to include installation of turbo-generator unit, boiler and auxiliary equipment. Estimated expenditure is $2,750,000.

NEWBERRY, MICH.—Newberry Lumber & Chemical Co. has started construction of a factory addition, to cost about $125,000.

UBLEY, MICH.—Thumb Electric Co-operative, care of F. Nelson, will spend approximately $300,000 for erecting electric power plant and distribution lines.

Illinois

ALTON, ILL. — United States engineers' office, Custom house, St. Louis, is taking bids for construction and installation of power, control and lighting system at lock and dam No. 26 in the Mississippi river near Alton.

CHICAGO — Lady Esther Co., 2012 Ridge avenue, Evanston, Ill., plans installation of electric power equipment in new one-story cosmetic manufacturing plant. Cost $450,000.

CHICAGO — International Harvester Co., 606 South Michigan avenue, plans erection of a three-story boiler plant and a one-story compressor station on the site of its new plant at Indianapolis. Estimated cost is over $100,000.

ROCKFORD, ILL.—Rockford Die & Tool Works Inc. has awarded contract to G. R. Sahlstrom for construction of a one-story factory addition.

ROCKFORD, ILL. — Mechanics Universal Joint Co., Eighteenth avenue, plans building a one-story boiler house, 60 x 100 feet, at a cost of $200,000.

ROCKFORD, ILL.—Cotta Transmission Corp., manufacturer of transmissions and gear boxes, plans construction of a one-story factory addition, 40 x 60 feet. Frank Carpenter, Harlem boulevard, is architect.

Indiana

EVANSVILLE, IND.—Sunbeam Electric Mfg. Co., West Morgan street, maker of automobile headlights, will install electric power equipment in the new additions it is making to its plant, at a cost of $250,000.

RICHMOND, IND. — City plans extensions in municipal electric plant, including high pressure steam boiler with stoker, at a total expenditure of $100,000. D. C. Hess is superintendent.

Georgia

AUGUSTA, GA. — City plans construction of waterworks, with PWA granting $180,000 out of total cost of $400,000.

CEDARTOWN, GA. — City will build sewage disposal plant costing $99,170, for which PWA has granted $44,627. Pumping plant will be built on Fairmont avenue.

Missouri

MOUNTAIN VIEW, MO.—City, J. F. Duncan, mayor, will construct a $51,000 waterworks system, for which PWA has allocated $23,000. Beard Engineering Co., Maplewood, Mo., is engineer.

Arkansas

COTTER, ARK.—Town takes bids Sept. 16 at office of R. E. Williams, engineer, 1007 Southern building, Little Rock, Ark., for water treating plant, including pressure filters, pump, chlorinator and filter plant building.

JONESBORO, ARK.—City, Lloyd M. Rebsamen, city manager, plans installing water and light plant at cost of $50,000.

Oklahoma

MARIETTA, OKLA.—Red River Valley Rural Electric Co., care of Crawford W. Cameron, Marietta, receives bids Sept. 21 for furnishing materials, labor and constructing rural electrification distributing system of approximately 150 miles.

Wisconsin

BEAVER DAM, WIS.—Malleable Iron Range Co., manufacturer of stoves and ranges, has awarded contract to A. E. Hutter for construction of a one-story foundry addition, 47 x 200 feet. R. R. Boyd, Spring street, is architect.

JANESVILLE, WIS.—Parker Pen Co., Kenneth S. Parker, president, has started construction of a two-story factory addition, 15 x 60 feet.

KENOSHA, WIS. — Holms Mfg. Co., manufacturer of jigs, tools and dies, has awarded contract to Lindemann Construction Co. for erection of a 1-story machine shop, 30 x 120 feet.

LA CROSSE, WIS. — Allis-Chalmers Mfg. Co., maker of tractor and farm equipment, has awarded contract to Lovering-Longbotham Co., St. Paul, for construction of additions to factory and for remodeling and rearrangement of present factory units at a cost of about $350,000.

MILWAUKEE—Pure Carbonic Co., subsidiary of Air Reduction Sales Corp., 818 West Winnebago street, will enlarge its plant in West Allis by an addition costing $15,000, with new equipment costing an additional $50,000. S. H. Smith is Milwaukee branch manager.

MILWAUKEE — Allis-Chalmers Mfg. Co. has received a contract to furnish and install complete equipment in a new six-story flour mill, 40 x 80 feet, for Tri-State Milling Co. at Rapid City, S. Dak. Engineers are Horner & Wyatt, Kansas City, Mo.

MILWAUKEE — Milwaukee Stamping Co., 874 South Seventy-second street, is building a factory addition, mainly for storage, and equipping space in main shop with new electric plating machinery and ovens.

OSHKOSH, WIS.—Paine Lumber Co. will resume operations in October in its sash and door factory, idle since 1932. The plant is being remodeled and considerable new equipment installed.

Minnesota

DULUTH—City plans to purchase four electric-operated pumping plants for sewage disposal system. Bids will be asked soon.

DULUTH — Diamond Calk Horseshoe Co., Otto Swanstrom, president, maker of calks, picks and wrenches, has awarded contract for construction of a plant addition.

FARMINGTON, MINN. — Independent Utility Co., D. C. Records, president, plans steam-electric generating plant, costing over $150,000. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, is consulting engineer.

MADELIA, MINN.—C. E. Seymour, village clerk, will take bids until Sept. 28 for construction of a municipal light and power plant and for diesel engine generator and auxiliary equipment. Burlingame, Hitchcock & Estabrook, Sexton building, Minneapolis, are engineers.

MINNEAPOLIS — Dynomol Light & Power Co., 109 Fourteenth avenue, Northeast, has been organized to manufacture automotive and commercial electric farm light plants.

MINNEAPOLIS—Land O'Lakes Creameries Inc., 2201 Northeast Kennedy street,

SOLVED!

Where to stay in CLEVELAND

600 large, modern rooms with bath and circulating ice water.

3 air-conditioned restaurants.

HOTEL CARTER

CLEVELAND, OHIO

Fay M. Thomas, *Manager*

SCREENS of Perforated Metal

The Harrington & King Perforating Co.

5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.

For Low Cost Industrial Heating—

"We Guarantee Results"

F. & D. Producer Gas Systems

Using Bituminous and Anthracite Coals Raw and Scrubbed Gas for Displacing Oil. City and Natural Gas, Coal and Coke in Furnaces of all descriptions.

Flinn & Dreffein Co., 308 W. Washington St., Chicago, Ill.

SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.

STRONG CARLISLE & HAMMOND

1400 W. 3rd St., Cleveland, O.

SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

STEWART INDUSTRIAL FURNACES OF ALL KINDS

Chicago Flexible Shaft Co., 1106 S. Central Ave., Chicago, U. S. A.
Canada Factory: 321 Weston Rd., S., Toronto • New York Office: 11 W. 42nd St., N.Y.

JAMES CRISWELL COMPANY

Furnace Engineers & Contractors

Open Hearth, Soaking Pits and heating furnaces

Keenan Bldg. **Pittsburgh, Pa.**

H. A. BRASSERT & CO.

CONSULTING ENGINEEERS

for Iron, Steel, Fuel and Heavy Metallurgical Industries.
PROJECTS, PLANT DESIGN, CONSTRUCTION OPERATION, MARKETS, FINANCE AND MANAGEMENT

310 South Michigan Ave. Chicago, Ill.

C. H. HUNT

CONSULTING ENGINEER

Specializing in Consultation on General Steel Mill and Industrial Plants

First National Bank Bldg., Pittsburgh, Pa.
Phone ATlantic 9985

The difference between Shafer roller bearings and other types is that the exclusive Shafer concave roller design provides: 1. rolling self-alignment (important in itself); *plus*, 2. generous capacity for radial, or thrust, or combined radial-thrust loads; *plus*, 3. simple adjustability. Only Shafer delivers all these features in the same bearing.

Available in a full range of sizes: Pillow Blocks • Flange Units • Take-up Units • Hanger Boxes • Cartridge Units • Duplex Units • Conveyor Rolls • Radial-thrust Roller Bearings.

SHAFER BEARING CORPORATION

35 East Wacker Drive Chicago

Everything You Need in a Roller Bearing

plans steam power house and cold storage plant at Lamberton, Minn. Estimated cost $100,000.

ST. PAUL—Minnesota Mining & Mfg. Co., manufacturer of abrasives, has awarded contract to William M. Murphy & Son, New York building, for construction of a four-story factory addition 150 x 300 feet, and for extensive remodeling to present plant, at a total cost of about $400,000.

WACONIA, MINN. — Carver County Co-operative Electric association has plans maturing for primary and secondary lines for rural electrification in several counties totaling 145 miles, with outdoor power substations and service facilities. Fund of $100,000 is being arranged. Banister Engineering Co., 556 Prior avenue, St. Paul, consulting engineer.

Texas

ELECTRA, TEX.—City, A. B. Corder, mayor, plans to build waterworks plant, including tanks and tower. Estimated cost $50,000. J. E. Ward, engineer, Wichita Falls, Tex.

ODESSA, TEX.—City voted $130,000 bonds for waterworks system and $60,000 for sewer system. Project includes 500,000-gallon reservoir, four 250-gallon-per-minute turbine pumps, 500-gallon-per-minute pump; 1000-gallon-per-minute booster pump. A. S. Adams, Handley, Tex., engineer.

ROCKPORT, TEX.—City has PWA grant of $47,000 for erection of $105,000 electric system and power plant, consisting of two 200-kilowatt diesel engines and auxiliaries, cooling tower and distribution system.

RAYMONDVILLE, TEX.—Willacy County Water Control and Improvement district No. 1, W. D. Woodroof, president, takes bids Sept. 24 for pumping plant improvements.

SHERMAN, TEX.—Co-operative Electric association, G. V. Bray, president, Celina, Tex., has FEA allotment of $100,000 for power line in Grayson and North Collin counties.

Kansas

McPHERSON, KANS.—Contracts will soon be placed for high-pressure boiler unit and auxiliaries. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., engineer.

RUSSELL, KANS.—City will soon ask bids for pumping plant on which bond issue of $127,000 has been approved. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

WHITE CITY, KANS.—City, George Hauserman, mayor, plans complete new waterworks plant, wells, tank and tower, costing approximately $52,000. PWA has allocated $23,629. Paulette & Wilson, 311 Farmers Union building, Salina, Kans., consulting engineers.

WICHITA, KANS. — Kansas Gas & Electric Co., First and Market street, is planning to erect a power plant with 20,000-kilowatt capacity to cost about $1,000,000.

WINFIELD, KANS. — City has been granted $81,637 by PWA to aid in financing construction of new sewage disposal plant of 900,000 gallons-per-day capacity and incinerator costing about $100,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is consulting engineer.

Iowa

BEDFORD, IOWA — City has been granted PWA loan of $14,400 to aid in financing construction of new sewage disposal plant and extension of sewer system. Total cost $32,000.

BOSSIER CITY, IOWA — City has plans under way for building a new municipal electric power plant, costing close to $200,000.

EPWORTH, IOWA—PWA has approved grant of $14,850 to aid in financing construction of sewer extensions and a new sewage disposal plant costing $33,000.

IDAGROVE, IOWA — Iowa Public Service Co., Sioux City, Iowa, is considering making extensions and improvements to its steam-electric power plant here, including installation of new engine-generator set and auxiliary equipment.

KEOKUK, IOWA—City plans construction of additions and improvements to waterworks plant, costing $300,000. PWA has approved grant of $157,000. P. F. Earl is city clerk.

LIME SPRINGS, IOWA—PWA has approved grant of $23,850 to aid in financing construction of sewer extensions and a complete new sewage disposal plant, costing $53,000.

MORNING SUN, IOWA—City has been granted PWA loan of $25,200 to aid in financing construction of a new municipal electric light plant, costing $55,000.

PERRY, IOWA—Donald Kanealy, city clerk, will have final plans complete about Sept. 20 for construction of a new sewage disposal plant, including filters, sludge beds, clarifiers and appurtenances. Buell & Winter, 506 Insurance Exchange building, Sioux City, Iowa, consulting engineers.

PRIMGHAR, IOWA — City will receive bids soon for municipal electric plant, costing approximately $125,000.

STANTON, IOWA—Bond issue of $24,000 was voted favorably at election Aug. 24 to finance construction of an electric distribution system. P. O. Swanson is mayor and Stanley & Young, Muscatine, Iowa, are consulting engineers.

WAVERLY, IOWA — City plans construction of a municipal light and power plant addition to cost about $160,000, including new diesel engine and auxiliary equipment. Young & Stanley, Muscatine, Iowa, engineers.

Nebraska

COLUMBUS, NEBR.—PWA has approved a grant of $180,000 and a loan of $220,000 to city to finance construction of an electrical distribution system, Julius S. Nichols is mayor, and Leo B. Woerth, Columbus, is consulting engineer.

CRETE, NEBR. — Norris Rural Public Power district has plans maturing for primary and secondary lines, totaling about 295 miles, with outdoor power substations and service facilities. Project will cost about $320,000.

HASTINGS, NEBR. — Western Land Roller Co., maker of agricultural implements, plans immediate construction of a one-story factory addition, 32 x 70 feet.

HOLDREDGE, NEBR.—City will soon let contract for diesel generator unit and auxiliaries, costing $68,000. Robert Fulton, 2327 South Nineteenth street, Lincoln, Nebr., is engineer.

Montana

CRESTON, MONT.—Flathead County Co-operative has applied to REA for $244,000 to finance proposed 225 miles of power lines, power to be supplied by Mountain States Power Co.

CUT BANK, MONT.—City is considering building a $65,000 storage dam and filtration plant, estimated to cost $90,000.

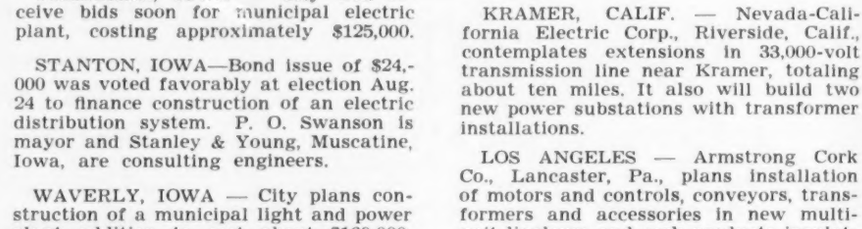
HELENA, MONT.—Board of education, vocational department of Helena high school, plans construction of a vocational building at the municipal airport to house departments of aeronautics, auto mechanics, welding and allied subjects. J. T. McBride is school clerk.

Pacific Coast

KRAMER, CALIF. — Nevada-California Electric Corp., Riverside, Calif., contemplates extensions in 33,000-volt transmission line near Kramer, totaling about ten miles. It also will build two new power substations with transformer installations.

LOS ANGELES — Armstrong Cork Co., Lancaster, Pa., plans installation of motors and controls, conveyors, transformers and accessories in new multi-unit linoleum and cork products insulating plant here. A power house will also be erected. Work will begin soon. (Noted STEEL, Sept. 6).

Versatility of Porcelain Enameling Shown



A WIDE variety of finishes, colors and designs available in porcelain enameling for architectural uses is shown in the new office building of Davidson Enamel Products Co. Inc., Lima, O. Two decorative plaques on either side of the door show characteristic views of enameling operations in nine colors, ranging from chocolate to ivory. The enamels are on 16-gage enameling iron made by American Rolling Mill Co., Middletown, O.

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

STEEL Keeps in Front

To the Editor:

I am glad to give you a favorable reaction to the free use of pictures, as in STEEL, Aug. 30, rather than long articles covering the same subject.

It is my feeling that people would much rather look at pictures, and unquestionably the use of interesting photographs showing detailed operations, would, in our opinion, be more appropriate.

Many trade magazines have not changed materially within the last ten years, and I believe it was STEEL magazine which made numerous innovations, which has lifted it above the average trade magazine.

One need only look at *Life* and its phenomenal growth to appreciate how popular a picture magazine is. I would say 40 per cent pictures and 60 per cent text would be about the right balance.

R. C. BYLER

Advertising Manager,
S. K. F. Industries Inc.,
Philadelphia.

Supply Food for Thought

To the Editor:

When a trade or business paper reaches our office, a sticker is pasted on the front cover. The sticker contains the names of our key men. Some papers are routed to but two or three of them. Several papers go to as many as nine men. When the last man has read the papers, they are returned to the advertising department for examination, and then are placed in the reading room, which is adjacent to the lunch room, and where our men have a chance to read them. A good many do, and they are pretty well used up before a fresh issue is available.

In addition, we subscribe for a number of publications for various men who receive and read them at their homes. We do not attempt to specify any definite reading, but, quite informally, call certain articles and items to the attention to those likely to be most interested.

We believe that the business press plays an important part within our organization, but it is on a voluntary basis. We do not believe that we can either make men read, or think.

GEO. H. COREY

Advertising Manager,
Cleveland Twist Drill Co.,
Cleveland.

Editor's Note—This refers to the article in STEEL, July 5, page 87, on "How Can I Make Them Think."

Pictures Tell Most

To the Editor:

We believe that the pictorial journey through a tractor manufacturing plant, starting on page 40 of the Aug. 30 issue of STEEL attracted more reader interest than a lengthy article on the same subject would have done. In fact we immediately clipped this article and sent it to our tractor division.

We believe readers are interested in current pictures with good captions, similar to the one also, for example, on the big speed ring shown on page 18 of the same, Aug. 30, issue of STEEL.

A. K. BIRCH

Allis-Chalmers Mfg. Co.,
Milwaukee, Wis.

The Bootstrap Miracle

To the Editor:

Comment in STEEL, Sept. 13, on the large use of automobiles by workers in the steel industry, as transportation to and from work, is not only an indication of better conditions and pay but also indicates that the workers are helping their own industry by the large contribution they make toward steel consumption, thus, in a way, actually raising themselves by their bootstraps.

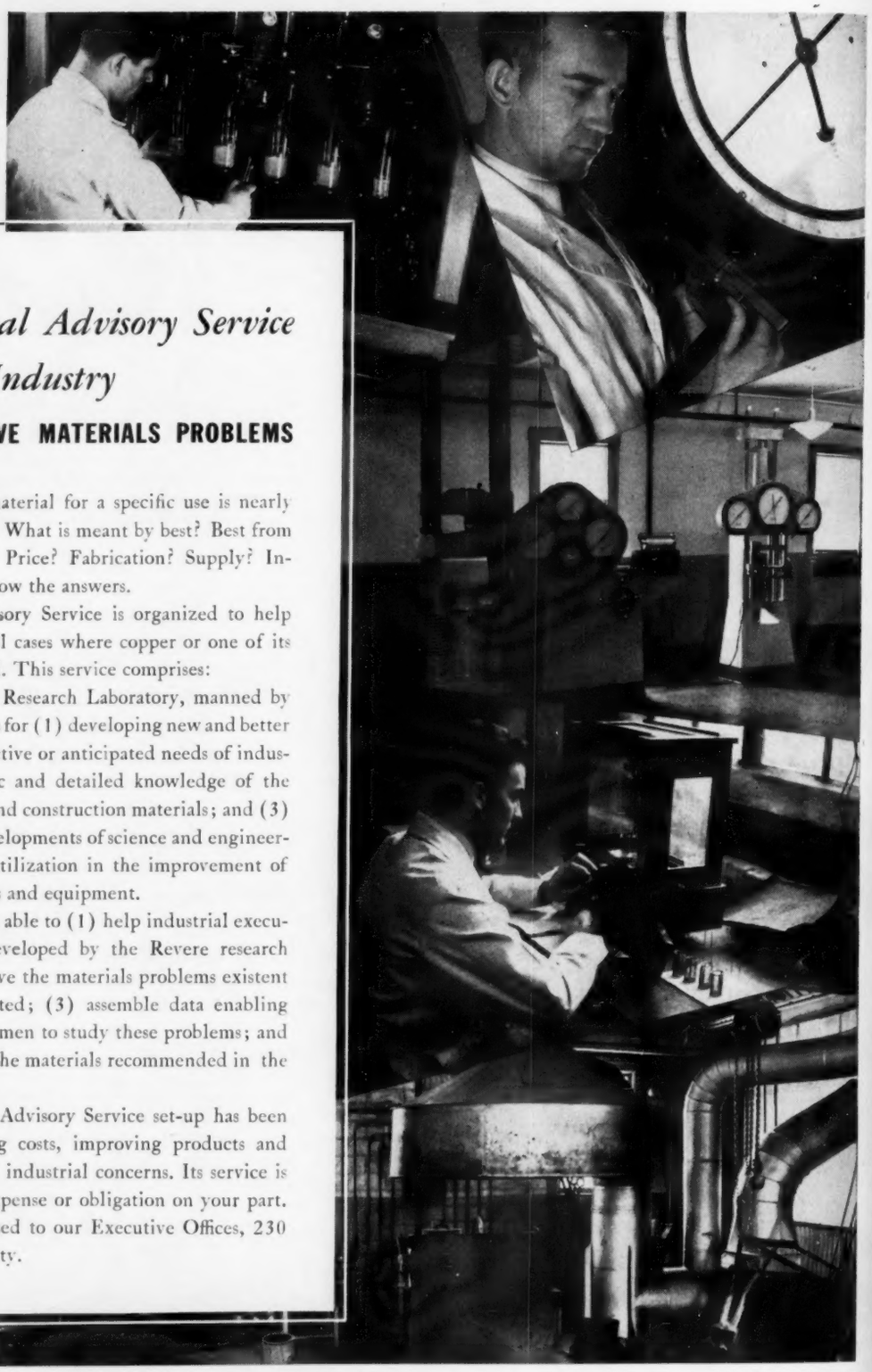
The automobile industry is one of the largest consumers of the steel we make and we are buying back a lot of it in the form of automobiles, whether they are new or used cars. This is only one of the links in the chain that lifts American workers to so high a plane, far above that of other countries. The steel workers are not the only ones giving this aid to their own industry, automobile workers also being large users of their own cars for transportation, thus, also, aiding their own business.

As a matter of fact, statistics show that by far the greater number of automobiles in the United States are owned by people earning no more than the steelworker and for the most part a smaller wage.

This is one of the best arguments I have seen for a high wage level, to enable workers to buy the products of their industries and thus contribute directly to their own standard of living. You might be surprised to know how many steelworkers also play golf.

STEELWORKER

Buffalo.



Revere Technical Advisory Service to Industry

ORGANIZED TO SOLVE MATERIALS PROBLEMS

Selection of the "best" material for a specific use is nearly always a complex problem. What is meant by best? Best from the standpoint of service? Price? Fabrication? Supply? Industrial executives must know the answers.

Revere Technical Advisory Service is organized to help you get these answers in all cases where copper or one of its alloys should be considered. This service comprises:

A thoroughly equipped Research Laboratory, manned by engineers and metallurgists for (1) developing new and better Revere materials to meet active or anticipated needs of industry; (2) supplying specific and detailed knowledge of the properties of engineering and construction materials; and (3) continuously observing developments of science and engineering with a view to their utilization in the improvement of Revere production methods and equipment.

A corps of technical men able to (1) help industrial executives make use of data developed by the Revere research laboratory staff; (2) perceive the materials problems existent in industrial plants contacted; (3) assemble data enabling Revere research laboratory men to study these problems; and (4) make practical tests of the materials recommended in the plants concerned.

This Revere Technical Advisory Service set-up has been very successful in reducing costs, improving products and increasing output for many industrial concerns. Its service is available to you with no expense or obligation on your part. Inquiries should be addressed to our Executive Offices, 230 Park Avenue, New York City.

Revere Copper *and* Brass

INCORPORATED

FOUNDED BY PAUL REVERE

1 8 0 1

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK CITY · MILLS: BALTIMORE, MD. · TAUNTON, MASS. NEW BEDFORD, MASS. · ROME, N. Y. · DETROIT, MICH. · CHICAGO, ILL. · SALES OFFICES IN PRINCIPAL CITIES